Consultative Committee for Space Data Systems

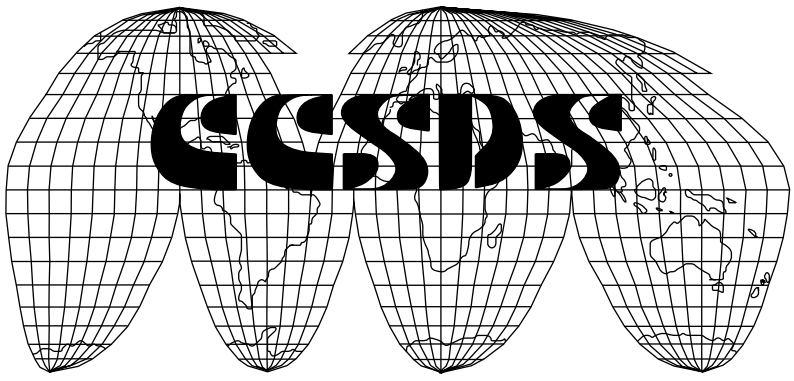
DRAFT REPORT OF THE MANAGEMENT COUNCIL

CCSDS MANAGEMENT COUNCIL MEETING MINUTES

CCSDS B10.0-Y-21

DRAFT YELLOW BOOK

November 2000



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CSA	Mr. Arvind Bastikar
DLR	Dr. Hubertus Wanke
ESA	Dr. Carlo Mazza
INPE	Dr. Eduardo W. Bergamini
NASA	Mr. John Kelley
NASDA	Mr. Hideo Hara
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Panel/Subpanel Chairmen

P1		Dr. K. Lenhart (ESA/ESOC)
	P1A	Mr. Greg Kazz (NASA/JPL)
	P1B	Gian Paolo Calzolari (ESA/ESOC)
	P1C	Dr. Pen-Shu Yeh (NASA/GSFC)
	P1E	Mr. Jean Luc Gerner (ESTEC/ESA)
	P1F	Mr. A. Hooke (NASA/JPL)
	P1J	Mr. Felipe Flores-Amaya (NASA/GSFC)
P2		Dr. David Giaretta (BNSC/RAL)
		Mr. Nestor Peccia (ESA)
		Mr. D. Sawyer (NASA/GSFC)
P3		Mr. Maurice Winterholer (CNES)
		Mr. J. Kaufeler (ESA/ESOC)
		Dr. H. Uhrig (ESA/ESOC)

Information

Mr. G. Delmas (ESA/ESOC)
Mr. M. Drexler (DLR/GSOC)
Mr. R. Stephens (QSS)
Mr. T. Gannett (GST)

CONTENTS

SUBJECT: Minutes of the Consultative Committee for Space Data Systems (CCSDS) Management Council (MC) Meeting

PLACE: Boulder, Colorado USA

DATE: November 29-30, 2000

I ATTENDANCE

Organization	Name
ASI	Mr. Mauro Donati
BNSC	Dr. Peter Allan
	Dr. David Giaretta
CNES	Mr. Roland Ivarnez
	Mr. François Forestier
DLR	Mr. Manfred Drexler
ESA	Dr. Carlo Mazza
	Dr. Klaus Lenhart
	Mr. Michel Morlon
INPE	Dr. Eduardo Bergamini
ISAS	Dr. Takahiro Yamada
NASA	Mr. John D. Kelley
	Mr. Adrian J. Hooke
	Mr. Felipe Flores-Amaya
	Mr. James Costrell
	Mr. Peter Shames
	Ms. Linda Kezer
	Mr. Robert Stephens
NASDA	Mr. Hideo Hara

II INTRODUCTION

Mr. John Kelley, acting CCSDS Chairman, at 0900 hours on November 29, 2000 convened the meeting. Following the call to order, the delegates and other attendees introduced themselves.

III WELCOMING REMARKS

On behalf of NASA, Mr. Kelley welcomed those in attendance. Mr. Kelley introduced Mr. Dan Baker, Director of the Laboratory for Atmospheric and Space Physics (LASP), who welcomed everyone on behalf of LASP. Mr. Baker indicated that the Laboratory has made significant use CCSDS Recommendations and noted, especially, that the economic success of their SNOE project was due in large measure to the adoption of CCSDS Recommendations, which allowed the reuse of much of the necessary support equipment. Dr. Baker envisioned continued use of the CCSDS Recommendations in the future as well as the Laboratory's participation in the program. He stated that the success of the control center (and the commercial control software that has come from it) is heavily indebted to CCSDS for providing such clean and functional protocols.

Mr. Randy Davis provided some administrative details. In addition, he remarked that LASP had been in the space business longer than NASA had.

IV AGENDA REVIEW AND APPROVAL

A new item, Strategic Plan and Operations Procedure, was added under Item 12. The agenda was then approved.

The final agenda is shown in Attachment A.

V REVIEW OF MINUTES FROM TOULOUSE, FRANCE

The minutes from the Spring 2000 meeting held in June 2000 in Toulouse, France, were approved.

VI SECRETARIAT REPORT

The Secretariat's report had been previously distributed to all members. This report contained the list of open action items, along with responses where indicated and a list of CCSDS documents and their status (Attachment B). Note was made of those six CCSDS documents that had achieved IS status since the last MC meeting. Ms. Kezer noted that CCSDS is obligated to notify ISO of any documents that are undergoing review. A resolution was proposed to provide a list of those documents under review/comment

along with the proposed changes. This resolution was approved (MC-F00-1). Ms. Kezer presented a new status for action item MC-S00-A03, which was closed. The final decision on this action was that P2 decided not to pursue a parallel review on DEDSL-XML document. The status of open action items is discussed below under item VII.

VII REVIEW AND REPORT OF OPEN ACTION ITEMS

Only the open action items from past meetings were discussed. Comments made concerning these open items are included below.

MC-F99-A4 Determine how the European Cooperation for Space Standardization (ECSS) will reference those CCSDS Recommendations which it adopts without alteration, especially those which have been progressed to ISO International Standard status.

STATUS: OPEN. Mr. Lenhart stated ECSS has not made a decision on how to reference the CCSDS Recommendations. It is leaning towards adopting the ISO recommendations. Mr. Hooke stated that the U.S. delegates to TC 20 would propose a change to ISO to show dual designations.

MC-S00-A01 Prepare a plan of work for resuming work on a draft recommendation for Efficient Modulations at High Symbol Rates Transmissions, Space research, Space-to-Earth, Category A. Notify the management council if resources are not available to resume this work.

STATUS: CLOSED

MC-S00-A02 Work with the Panel 3 chairman to establish a formal liaison between CCSDS and the OMG, and to establish a pilot program of joint OMG/CCSDS work. Report status at the next meeting.

STATUS: CLOSED. There will be a joint meeting December 12, 2000, in Orlando.

MC-S00-A06 Develop a statement of work relative to onboard electrical interfaces for consideration by SC-14.

STATUS: OPEN. Peter Shames to discuss

MC-S00-A08 Review and comment on proposed on-line software license agreement.

STATUS: Discussed with A17.

MC-S00-A09 Investigate possibilities for providing a site to host an on-line software library.

STATUS: **Closed. Combine with S00-A08.**

MC-S00-A17 Develop clear position reflecting both Agency as well as national requirements regarding the terms necessary for accepting patents as part of CCSDS Recommendations.

STATUS: **Recommend closing this action and combining with S00-A08.**

MC-S00-A13 Identify tracking stations that can participate in STRV interoperability tests; provide via e-mail to the Subpanel 1F chairman with copy to Secretariat, (1) station locations and link characteristics and (2) ideas for interoperability testing.

STATUS: CLOSED for NASA (DSN stations). An action was assigned to the TSG Chairman to present a status report on the STRV testing at the Spring 2001 meeting.

MC-S00-A14 Define participants, agenda, and meeting location for CCSDS Tactical Planning meeting (cf. resolution **MC-S00-09**).

STATUS: CLOSED

MC-S00-A15 Contribute ideas for 20-year anniversary plenary meeting location, agenda details, etc. (cf. resolution **MC-S00-10**).

STATUS: OPEN. Various possibilities discussed; e.g., ITC meeting in Garmisch in Spring 2002; SpaceOps April 2002 in Johnson Space Center, Houston; IAF and COSPAR October 2002, also in Houston. A new action was assigned to the TSG and Panel Chairs plus the Secretariat to decide and report to the next Management Council meeting. First target is SpaceOps. Roland Ivarnez is on the organizing committee, which will be meeting next week. He will try to make one whole day available for CCSDS, plus posters, etc.

MC-S00-A16 Identify core representatives who must attend TSG meetings (cf. resolution **MC-S00-11**).

STATUS: CLOSED. Panel Chairs, Subpanels Chairs, Working Group chairs plus ad hoc committee chairs. Possibly key agency POC or their nominee who hold budgets. David Giaretta points out that the TSG needs to develop and architecture before it can really clarify items. Mr. Drexler presented the current TSG charter, which includes the development of such architecture.

MC-S00-A18 Provide to the Secretariat ideas for a procedural checklist for Panel chairs to use when proposing document status changes (e.g., White Book to Red Book, Blue Book to Pink Sheets, etc.). Procedures should include, but are not limited to, assurances that consensus within the Panel has been reached and that associated Technical Reports have been drafted/updated to support technical recommendations.

Assignee:	All Panel/Subpanel Chairs
Due Date:	August 31
STATUS:	CLOSED. No Comments received.

MC-00-A19 Develop draft procedural checklist for Panel chairs to use when proposing document status changes (e.g., White Book to Red Book).

Assignee:	Secretariat
Due Date:	November 2000 MC Meeting
STATUS:	Closed. No items submitted.

VIII AGENCY REPORTS

ASI. Mr. Donati presented the ASI report. He discussed ASI's planned space programs that will include CCSDS considerations. He reported that ASI is involved in the IOCG.

Mr. Donati's report is Attachment C to these minutes.

BNSC. Dr. Allan presented the BNSC report. He reported that the BNSC is different in that it is a virtual organization, with an office in London and a lot of smaller bodies coming together to get work done. Their CCSDS work is contracted to DERA and resources are about 2 man-years. He noted recent activities relative to STRV and P2 document review, while VEGA does P3 services implementation. He listed the usage of CCSDS Recommendations within the BNSC program and new developments within BNSC.

Dr. Allan's report is Attachment D to these minutes.

CSA. Due to the absence of Dr. Bastikar, there was no CSA report.

CNES. Mr. Forestier presented the CNES report. He stated that their activity was at a three man-year level. CNES' new satellites will be CCSDS compatible for telemetry and telecommand. He reported that the EAST and OASIS software programs are available via the world wide web. He noted that CNES experts are involved in all panels and Subpanels, and described their involvement in each.

Mr. Forestier's report is Attachment E to these minutes.

DLR. Mr. Drexler reported on DLR's involvement in many aspects of CCSDS, including STRV tests. He notes plans to become more active in promoting SLE services. He listed the GSOC missions that are using CCSDS features.

Mr. Drexler's report is Attachment F to these minutes.

ESA. Dr. Mazza presented the ESA report. He reported that ESA has been involved in hosting many CCSDS-related meetings. Their effort involves some 15 professionals – a total of give man-years. He stated that basically all future ESA missions would have CCSDS applications.

Dr. Mazza's presentation is Attachment G to these minutes.

INPE. Dr. Bergamini presented the INPE report. He indicated that INPE continues to support CCSDS and renewed the INPE invitation to host the MC and SC13 meetings in the Fall of 2001 at INPE, in Sao Jose dos Campos. Dr. Bergamini stated that INPE had recently requested of NASA a SCID assignment. He was concerned that there is no clear way of getting an acknowledgement of NASA's having received this request, nor is there a name of a person of whom inquiry can be made. (An action was established for the Secretariat to investigate this and the matter has been resolved.)

Dr. Bergamini's report is Attachment H to these minutes.

NASA. Mr. Hooke presented the NASA report. He reviewed NASA's organization of which standards are a part – starting with the Space Operations Management Office (SOMO). He showed the several levels of Standards activities and included NASA's relationship with the SOMO contractor. He identified the several personnel changes within NASA that have occurred in the last six months. He reported a fairly constant level of resources for the CCSDS work over the past several years. He anticipates a strengthened attitude within SOMO contractor relative to data standards. He noted that the tendency of the US government to sell off the spectrum is bringing pressure to the space program as to how to live within constrained bandwidths. He reported that the DoD has established a Satellite Operations Transition Plan, which is baselining CCSDS Packet Telemetry for use in aircraft and missile test ranges. He indicated that we need to think about changing the charter to eliminate reference to "peaceful uses of space." Mr., Hooke mentioned the database activity, which is maintained by NASA, and encouraged each agency to provide the Secretariat with any information about international missions using CCSDS Recommendations. He stated that Panel 2's work on Data Archiving is receiving wide acclaim and adoption in many organizations throughout the world. He also reported on the recent International Telemetry Conference and its very successful results relative to CCSDS.

Mr. Hooke's report is Attachment I to these minutes.

NASDA. Mr. Hara presented the NASDA report. He reported that the Satellite Mission Planning Dep. Of Office of Satellite Systems is responsible organization in NASDA. NASDA reactions to CCSDS outputs are coordinated in the Space Data Systems Committee, which consists of about 25 members from several NASDA offices. He reported on NASDA's involvement in the three panels. Total manpower has been kept at approximately two persons/year. None is exclusively dedicated to CCSDS activities. Mr. Hara reported that the development of next generation ground stations that can cope with the CCSDS recommendations have entered manufacturing phase. These stations will enter operational phase by April 2002. NASDA needs to provide update to the CCSDS Ground Station Green Book for the new stations.

Mr. Hara's report is Attachment J to these minutes.

RSA. Due to the absence of an RSA representative, there was no report.

ISAS. Dr. Yamada reported on ISAS activities. He showed ISAS' mission list, which uses a standard format for operations and testing. He feels there will be more standards in the future in this area. He presented a list of documents with which he is involved and indicated that he needs a method to track the status of these nine books. He felt that every chairman should maintain a similar list for each document assigned to his/her panel. He volunteered to develop such a "check-off" list. The MC resolved to accept this recommendation and direct the panels to maintain this checklist for future meetings (Resolution MC-F00-16).

Dr. Yamada encouraged member agencies to streamline the review of the restructured CCSDS draft red books as soon as each document becomes available after Panel 1A review. These documents are:

- TM Space Data Link Protocol, CCSDS 132.0-R-1;
- Space Packet Protocol, CCSDS 133.0-R-1;
- TC Space Data Link Protocol, CCSDS 232.0-R-1;
- Communications Operation Procedure-1, CCSDS 232.1-R-1;
- AOS Space Data Link Protocol, CCSDS 732.0-R-1;
- Channel Coding and Synchronization-Part 1: Synchronous, CCSDS 131.0-R-1;
- Channel Coding and Synchronization-Part 2: Asynchronous, CCSDS 231.0-R-1

The P1A chairman has established a schedule in an effort to expedite the review of all the restructured P1A documents. The approach is to break down this very big job (should all the documents be released at once) into a series of smaller jobs by releasing these documents in a series of releases. The Secretariat is instructed to prepare review materials and initiate Agency review.

Mr. Yamada also recommended that a standard language be developed for mission operations and that XML be considered as a candidate. An action was assigned to Messrs. Shames, Yamada, Giaretta to study additional languages, including XML, for developing a standard language for operational data to enhance interoperability among different application programs used for space craft operations and report at next meeting. (Action F00-A03)

Dr. Yamada's report is Attachment K to these minutes.

IX REPORT FROM LIAISONS AND REVIEW OF LIAISON RELATIONSHIPS

IACG and WG4—Mr. Costrell provided background on the IACG (Inter Agency Consultative Group), which addresses space science only and includes ISAS, ESA, IKI, and NASA. This group was formed to discuss collaborative space science opportunities. Working group 4 was established to look at interoperability of data among the scientists of the different agencies.

Dr. Yamada provided IACG Working Group 4's terms of reference, which included interoperability with respect to TT&C. It was pointed out that recently WG-4 has undertaken assessment of relevant Earth orbit and deep space support facilities. Its members are surveying respective future plans and trying to assess the results of an increasing load on these support facilities. They are also assessing the status of CCSDS and possible benefits of adopting CCSDS Recommendations in support of their goals for interoperability as part of their identification of required enhancements. WG-4 made several recommendations as to instructions that should be issued to relevant CCSDS panels. These recommendations are very similar to recommendations of IOCG. Dr. Yamada's presentation is Attachment L.

IOAG – Mr. Costrell provided background on this activity, including details of a meeting held in June 1999. This meeting was to establish a several-agency body to deal with multilateral interoperability requirements among its member agencies (ASI, CNES, DLR, ESA, ISAS, NASDA and NASA). This meeting resulted in establishing a body to address interoperability -- Interagency Operations Advisory Group (IOAG). This organization advises the Interoperability Plenary, SFCG, ITCOP, International programs and projects, and CCSDS.

Mr. Ivarnez provided an organizational relationship chart of the IOAG and other bodies, and described the operating mode of this activity. He also presented several liaison statements from the IOAG to the CCSDS MC. Mr. Ivarnez's presentation is Attachment M.

After extended discussion on both the IACG WG4 recommendations and the IOAG liaison statements, a number of CCSDS Resolutions were taken. These resolutions are recorded as MC-F00-17, MC-F00-18, MC-F00-19, MC-F00-20, and MC-F00-21.

IOAG and CCSDS will maintain a liaison relationship.

OMG – Mr. Shames reported on the activities in connection with the OMG at the TSG Meeting on November 28, 2000. However, a summary is provided here for the record. He noted that OMG is in the process of applying for Liaison status with CCSDS. He reported on OMG status, including the development of a reference architecture. The OMG will be issuing its first RFC, focussing on command and telemetry services. OMG is adopting the SLE model.

Mr. Shames suggested CCSDS must become more active in the Space Task Force. The chairman proposed distributing CCSDS materials, like the CCSDS ROM and the brochure at the OMG meeting. He stated that the OMG brings expertise in many areas that could be beneficial to CCSDS whereas we bring knowledge of space data systems.

OMG's intent is to develop a single architecture using object technology for distributed, integration guaranteeing reusability of components, interoperability and portability. With regard to the CCSDS relationship with OMG, Mr. Shames noted that the OMG approved the creation of a formal Space Task Force. He noted that the MC has recommended creation of formal liaison with OMG and that he was named as Liaison person.

Interplanetary Internet Status Report – Mr. Hooke reviewed the background of this activity and described the environment for this work. It seeks to take little pieces of the Internet technology and use it locally in a short-link situation at the various planets. An interplanetary backbone is needed which is quite permanent in nature. Users can plug into the backbone so the problem becomes the short distance networks communi8cating across the very long backbone. He noted that the backbone would be CCSDS compatible. He envisions bundling protocols (next generation CFDP) to connect applications with the transport layers at the several destinations. He described the problem and the resolutions under development. Mr. Hooke's presentation is Attachment N.

X PANEL AND TSG REPORTS

Because all those in attendance had attended the TSG meeting on the preceding day, panel reports were not repeated. Klaus Lenhart gave a summary of the Panel 1 report with the proposed resolutions. He explained the solution reached relative to the P1E resolution on bandwidth efficient modulation techniques and provided a list of documents being proposed for progressing to the next phase. Following Mr. Hooke's recommendation, it was agreed to transfer the CCSDS BB on Audio/Video to the Obsolete Documents. Should ESA or some other organization wish to revive it, the RID process could do this.

"There was discussion relative to the technically excellent nature of some of CCSDS's work. A recommendation was made that a permanent Distinguished Service Award be established, which would be given on occasion to a member who had made a seminal contribution to the CCSDS program. Following MC acceptance of this recommendation, there was unanimous agreement that Mr. Warner Miller of NASA be the first recipient of this award.

The following Resolution was taken: The MC resolves that the Secretariat be authorized to establish a permanent Distinguished Service Award to be awarded to a CCSDS member on the occasion of a seminal contribution to the CCSDS program. The Secretariat was

instructed to make this award truly aesthetic in nature and one that could be displayed conspicuously by the recipient. Further, it was resolved that Mr. Warner Miller of NASA be the first recipient of this award for his work in Channel Coding and Data Compression."

He noted a necessary modification to the current SCPS NP document since IP4's required authentication header is currently missing in that document. It was suggested that a demonstration be developed to show the IETF how IP packets can be multiplexed into CCSDS Structures.

A Resolution was made to send out the CFDP RB 3.3 for ISO DIS balloting (Resolution MC-F00-13).

Mr. Kelley suggested that the CCSDS Procedures manual be modified to show the ISO review as an option.

Dr. Lenhart's presentation is Attachment O.

Panel 2

Dr. Giaretta reported on the progress of several P2 documents, including:

- Moving DEDSL - XML/DTD to RB status (He would contact W3C to put this document on their XML pages as a note).
- Conducting an e-mail ballot to publish the DEDSL Abstract Syntax as a Blue Book.
- Incorporating Pink Pages into the EAST Blue Book.

He noted that the ISO DIS balloting of the OAIS Ref Model had been complete. There are now plans to incorporate comments received from this process into a RB-2 version of the document (for external review) later in 2001. Dr. Giaretta agreed to develop an explanation of changes made to RB-1 to accompany this second review.

The revised PVL is to be published as a BB.

Dr. Giaretta's presentation is Attachment P.

Panel 3

There were no specific resolutions to be made by P3 since it had not met since the last MC meeting. However, P3 was instructed to provide any resolutions from its December meeting for inclusion in the minutes. A copy of the Panel 3 report submitted at the MC, as well as a summary of the December meeting, are included as Attachment Q.

Technical Steering Committee (TSG)

Mr. Lenhart reviewed the TSG activity. He noted that there is a possibility that P3 may possibly publish separate Service Management documents for each Service document as opposed to one single very large document. It was agreed that the TSG has the action to notify P3 of Resolutions taken in response to IOAG and IACG recommendations. Regarding the 20-year anniversary, Mr. Ivarnez proposed that we try to get some time on the first day Plenary of the Space Ops 2002 with an additional session on the other days. Mr. Lenhart presented some proposed recommendations for the 20-year anniversary. This could include:

- Overview of CCSDS
- Strategic and Performance Plan
- Missions agencies facilities
- Overall architecture
- Key Recommendations
- CCSDS Products, Benefits and Main advantages
- Typical applications: Integral, SNOE
- Results of international interoperability (STRV tests)
- Specific Recommendations
- Future Interplanetary Internet
- Exhibition Booth, posters, CC-ROMs, Product Brochures
- Demos, simulations
- Web page, CCSDS organization

Mr. Shames agreed to take the lead regarding the small working group to report on relevant work outside as part of a proposed NWI for a standard language for data description.

Mr. Hooke presented a TSG Planning/Architecture Working Group work over the next six months. He proposed that a team be established to report at the next MC meeting. This team will include M. Drexler, D. Giaretta, P. Shames, M. Morlon, M. Winterholer, A. Hooke and T. Gannett (editor).

Drafts of the written Panel and TSG reports are included for information as attachments to these minutes. Several panel documents were approved for release (see resolutions **MC-S00-12—MC-S00-21**) based on panel reports presented at the TSG (see Attachment R).

Dr. Lenhart expressed his appreciation to NASA and LASP the excellent facilities and to the MC for supporting him as Panel 1 Chairman. He nominated Michele Morlon as his replacement. The MC approved. The MC expressed appreciation for Dr. Lenhart's contributions.

Dr. Lenhart nominated Manfred Drexler as his replacement as TSG Chairman. The MC approved.

XI SPECIAL TOPICS

Agency Positions on Recommendation on Bandwidth Efficient Modulation – This subject had been reported earlier during this meeting as having been successfully resolved. See Resolution MC-F00-9.

There was some concern expressed about growing bandwidth restrictions in the deep space environment. A resolution was proposed for forwarding to the SFCG pointing out the need to address these frequency allocations. However, based on a subsequent discussion with Mr. David Struba, Mr. Kelley stated that this was not necessary. There are already bandwidths identified for the deep space environment.

CCSDS Software Programs on CCSDS Web Site -- Mr. Hooke discussed the adverse problems associated with restrictions to distributing software with CCSDS Recommendations. He felt this was critical to the success of CCSDS. He deplored our ever getting a blanket approval to release software from the NASA. He noted that the Internet uses Universities to generate code without restrictions.

It was noted that CNES has been able to put the SCPS software (which they now have) on its Web site. NASA will continue investigating release possibilities for its software. Meanwhile both BNSC and NASA should look at any issues associated with the CNES site. Action established for both to look at issues regarding listing software.

Upgrades to CSP and COP – In view of the time that has lapsed since these documents had been finalized, it was decided that the Secretariat should distribute the latest versions to the members. Comments are due back to Mr. Drexler by March. (See Action F00-A13)

STRV Testing – This item was discussed during the Action Item review.

Report on Software Library Planning – Mr. Hooke summarized where we are in this area. National regulations for NASA and NASDA may impede software distribution. P2 has got away with it, but P1 and P3 may be more difficult because of commercial implications. SCPS was done by putting the software into US public domain then getting export license ---- however probably NOT be able to do this for other items.

Distribution is critical to standardization. The CCSDS needs "off-shore" development and distribution mechanism for software. "Off-shore" fingers need to type the code and "assisted" heavily by others including NASA. This would require resources; quid-pro-quo arrangement needed

Mr. Hooke commented that the Internet community uses Universities to disseminate code. Licensing depends on distribution mechanism. Open source/GNU license, plus local liability protection. He asked for an agency to volunteer to do "offshore CCSDS software development and distribution." BNSC (as STARLINK) for distribution PMA will investigate. Other considerations were maybe Universities for development or DERA (Defense Evaluation and Research Agency). CNES may be able to put these on their servers. Mr. Ivarnez will investigate. NASA will continue to look at legal constraints.

CCSDS Reference Model (CRM)

Dr. Bergamini described the need for and his concept of a CCSDS Reference Model. He saw it as an abstract model and considered the existing Data Flow model as a point of departure for:

- A CCSDS Layered Model (CLM), and
- A CCSDS Application Profile (CAP)

He stated that under a unique CRM, a collection of pertinent CLMs might be documented while a CAP may become part of its pertinent Recommendations, possibly as an appendix that might be revised every five years. He showed current and proposed scenarios and volunteered to develop a better drawing to be aggregated into these minutes

Dr. Bergamini requested that this be considered as a potential agenda topic for the next MC meeting.

International Astronautical Federation (IAF)

Dr. Bergamini reported the next IAF would be held in Toulouse. He suggested the MC might want to pursue some special session about CCSDS. Mr. Ivarnez commented that the IAF is such a large venue that CCSDS would get lost. Mr. Lenhart stated that we should take any opportunity to address an international forum. To communicate to the

broadest community the CCSDS capabilities, Dr. Bergamini encouraged members to submit presentations and papers to the IAF Conference in Toulouse (Action F00-A15).

CCSDS Web Site

There was considerable discussion about upgrading and enhancing the current CCSDS web site. Mr. Shames presented several possibilities for improving the current site.

Mr. Shames made a proposal reflecting his thoughts about recommended changes to the Web Site. He showed the current contents of the site. He stated that he had received a number of adverse comments about the site at the ITC, including "It was not up to the professional standards for a Web site." He suggested upgrades and enhancements but reminded everyone that all this is exploratory.

Some suggestions made by Mr. Shames and proposed by members of the MC included:

- Make site more user-friendly and easier to navigate
- Make new items more visible
- Include more current info on projects
- Update appearance add more graphic content
- Improve search capabilities
- Links to related CCSDS org Web sites

Mr. Shames then showed the schema for a three-part conceptual site structure, which he had designed for a similar use. It was composed of several layers:

- A Marketing layer or Public web site with open access/CCSDS member access
- A Panel Chair/Public Access layer for Library/CCSDS member access
- A Private Database – Member agency/Observer agency/Associates' Implementations with protection of some sort

To avoid bandwidth/cost concerns, it is possible to include a "Use switch" for Graphic or Text Only versions.

Mr. Shames also reported that a commercial identity has already registered CCSDS.COM although it has not yet gone pubic. Although it was recognized that this could be beneficial, there was also concern expressed about how this site would be used MissionSpace has agreed to await publication until MC has had a chance to discuss this.

The MC resolved to give NASA a free hand to explore more creative ways of doing the web and to register CCSDS with all sensible domains. (See Resolution MC-F0026)

A copy of Mr. Shames' charts are in Attachment S.

XII ANY NEW BUSINESS

There were no new items brought up under this session.

XIII PLANNING FOR NEXT SET OF MEETINGS

The British National Space Center (BNSC) will host the Spring CCSDS Management Meeting to be held June 6-7, 2001.

The MC thanked the Brazilian delegate for the offer to host the Fall 2001 meeting in Brazil. A few members noted severe travel constraints in traveling to Brazil, so decision was deferred until the Spring 2001 meeting. An alternate invitation was issued by the United States to host the Fall meeting in Orlando, Florida.

The Spring 2002 meeting will be scheduled in conjunction with 20th anniversary.

XIV RESOLUTIONS AND ACTIONS

Due to time constraints, the resolutions and action items were not read. A draft will be provided to MC members by December 7, 2000.

XV ADJOURN

Prior to the meeting's being adjourned, Dr. Lenhart announced his retirement from ESA and that he would, consequently, be relinquishing the chairmanship of Panel 1. In light of ESA's wish to retain the P1 Chairmanship, they were nominating Mr. Michel Morlon to replace Dr. Lenhart. Mr. Morlon's nomination was approved unanimously.

Dr. Lenhart also announced that he would be relinquishing the Chairmanship of the TSG. In light of ESA's wish to vacate this position, and considering that DLR has expressed an interest in assuming this position, the nomination of Mr. Manfred Drexler as TSG chairman was unanimously approved.

The following resolution was then unanimously adopted:

"The CCSDS Management Council resolves to express its deep appreciation for the long and dedicated service of Dr. Klaus Lenhart. It especially wishes to note that Dr. Lenhart served admirably in two different and distinct capacities:

- As Chairman of Panel 1, which, under his leadership, has been particularly productive and,
- As Chairman of TSG which under his technical leadership and guidance has directed the entire CCSDS program.

He has exemplified the spirit of the CCSDS and he will be greatly missed, both professionally and personally. We all thank you Dr. Lenhart."

In recognition of the extraordinary and long-term technical contributions made by Mr. Warner Miller, the CCSDS Management Council resolved to award him its highest level of service commendation. The Secretariat is instructed to formulate the citation for review by the Management Council, and to procure a suitable plaque for presentation to Mr. Miller at an opportune time in the near future.

The meeting was adjourned at approximately 1:30 p.m.

DRAFT RESOLUTIONS
CCSDS Management Council Meeting
November 29-30, 2000

MC-F00-1 The CCSDS resolves to provide ISO with notification of pending changes along with a copy of changes so that the CCSDS Agency and ISO reviews can be conducted in parallel, at the discretion of the individual document editor's discretion.

MC-F00-2 The CCSDS resolves to release Packet Telemetry, Pink Sheets, CCSDS 102.0-P-4.1 as a Blue Book, contingent on completion of agency approvals. The Secretariat is instructed to make arrangements for publication.

MC-F00-3 The CCSDS resolves to release Packet Telemetry Services Pink Sheets, CCSDS 103.0-P-1.1. The Secretariat is instructed to prepare review materials and initiate Agency review.

MC-F00-4 The CCSDS resolves to release Telecommand, Part 2 Pink Sheets, CCSDS 202.0-P-2.1. The Secretariat is instructed to prepare review materials and initiate Agency review.

MC-F00-5 The CCSDS resolves to release Telecommand, Part 3 Pink Sheets, CCSDS 203.0-P-1.1. The Secretariat is instructed to prepare review materials and initiate Agency review.

MC-F00-6 The CCSDS resolves to release Advanced Orbiting Systems Networks and Data Links, Pink Sheets, CCSDS 701.0-P-2.1. The Secretariat is instructed to prepare review materials and initiate Agency review.

MC- F00-7 The CCSDS resolves to request the CCSDS to release Space Link Identifiers, White Book, SLI-DW-3 as a Red Book. The Secretariat is instructed to prepare review materials and initiate Agency review.

MC- F00-8 The CCSDS resolves to release Telecommand Part 2.1 COP-1 Pink Sheets, CCSDS 202.1-P-1.1 for Agency review. The Secretariat is instructed to prepare review materials and initiate Agency review.

MC- F00-9 The CCSDS resolves that the following three recommendations be released for Agency Red Book review:

- Rec. 3.3.5A Modulation Methods at High Symbol Rates Transmissions, Space Research, Space-To-Earth, Category A
- Rec. 3.3.5B Modulation Methods at High Symbol Rates Transmissions, Space Research, Space-To-Earth, Category B

- Rec. 3.3.6 Modulation Methods at High Symbol Rates Transmissions, Earth Exploration Satellites (EES) 8 GHz Band, Space-To-Earth

The Secretariat is instructed to prepare review materials and initiate Agency review.

MC-F00-10 The CCSDS resolves that the Blue Book for "Audio, Video and Still Image Data Transfer" should be moved to the Obsolete/Withdrawn" section of the CCSDS web site. ESA is invited to attempt to assemble resources to review and suggest updates to the book, in which case they should update the specification and circulate Pink Sheets for review.

MC-F00-11 The CCSDS resolves that Pink Sheets shall be issued in association with the SCPS Network Protocol Blue Book (CCSDS 713.0-B-1) that defines how the SCPS-NP can carry the IPv4 Authentication Header.

MC-F00-12 The CCSDS resolves that Subpanel 1F is authorized to create an Internet Draft which defines that the CCSDS Link layer protocols provide legitimate "sub-IP" services, and which specifies how the IP packet may be multiplexed into a CCSDS space link.

MC-F00-13 The CCSDS resolves that the Issue 4.0 Red Book the CCSDS File Delivery Protocol (CFDP) shall be submitted to ISO for international review as a Draft International Standard. Formal CCSDS Agency review of the CFDP Red Book shall be deferred pending a recommendation from Subpanel-1F at its next meeting.

MC-F00-14 The CCSDS resolves to publish the DEDSL-XML/DTD (CCSDS 647.3-R-1) as a red book. The Secretariat is instructed to prepare review materials and initiate Agency review.

MC-F00-15 The CCSDS resolves to upgrade the EAST Pink Sheets to Blue status. The Secretariat is instructed to make arrangements for publication

MC-F00-16 The CCSDS resolves to accept the recommended table, with proposed changes, presented by ISAS/Mr. Yamada to track the status of CCSDS documents and direct the panels to maintain this checklist for future meetings. Mr. Yamada will provide a copy of this checklist to the Management Council and Panel Chairs.

MC-F00-17 In response to the IOAG Recommendation No 1.a. and the IACG WG 4 Recommendation No. 1, the CCSDS resolves to instruct the P3 chairman to develop a plan at its December international meeting so as to assure the current dates for the completion of the following SLE documents to attain Blue Book status will be met:

RAF	1Q2001
RCF	1Q2001
CLTU	1Q2001

MC-F00-18 In response to the IOAG Recommendation No. 1.b., the CCSDS resolves to instruct the P3 chairman to assure that completion of the SLE Transfer Services API meets the current completion date of 1Q2001 for a Blue Book, taking into due account the specification of the Integral implementation.

MC-F00-19 In response to the IOAG Recommendation No. 2, the CCSDS resolves to inform the IOAG that it will support the development and maintenance of a database of missions and facilities that are using or plan to use CCSDS recommendations, if it is given the necessary information and resources. The CCSDS requests the IOAG members to conduct a survey and compile a list of CCSDS compliant missions and facilities, both present and future, together with the required services and options. The CCSDS will provide the required templates for gathering this information. Once this information has been made available by the IOAG, and given the required resources, the CCSDS will undertake the implementation and maintenance of this database, along with the necessary input capabilities and database management functions, and make these broadly available via the Internet and other means as required.

MC-F00-20 In response to IACG WG 4 Recommendation No. 2, the CCSDS resolves to recommend to the IACG that they delegate experts to P3 so as to provide P3 with inputs on managed objects planned for MUSES-C and/or ROSETTA.

MC-F00-21 In response to IACG WG 4 Recommendation 3, the CCSDS resolves to forward to the Panel 1J their request to urgently complete the standard Trajectory Data Exchange encompassing both:

- the definition of a State Vector and
- a Trajectory Interchange File

MC-F00-22 The CCSDS resolves to establish a team to explore a standard language for data description for space operations. Team will be Messrs. Giaretta, Yamada, Shames, and Peccia.

MC-F00-23 The CCSDS approves Michel Morlon as Chairman of Panel 1.

MC-F00-24 The CCSDS approves Manfred Drexler as Chairman of the TSG.

MC-F00-25 The CCSDS expresses its deep appreciation for the long and dedicated service of Dr. Klaus Lenhart. It especially wishes to note that Dr. Lenhart served admirably in two different and distinct capacities:

- As Chairman of Panel 1, which under his leadership has been particularly productive, and

– As Chairman of TSG, which under his technical leadership and guidance has directed the entire CCSDS program.

Dr. Lenhart has exemplified the spirit of the CCSDS and he will be greatly missed, both professionally and personally. We thank you, Dr. Lenhart.

Further the Secretariat is instructed to prepare a special CCSDS Certificate of Recognition of Dr Lenhart.

MC-F00-26 The CCSDS resolves to allow NASA to explore new web site upgrades. The Secretariat should take action to register CCSDS with all domains.

MC-F00-27 The CCSDS resolves to establish an architecture team led by Adrian Hooke. Other members will be Messrs. Morlon, Drexler, Winterholer, Giaretta, Shames and Gannett (Editor). This team is to produce a CCSDS Interoperability Architecture for review by the TSG and Management Council at their June meetings with view towards subsequent presentation to the IOAG.

MC-F00-28 The CCSDS resolves to establish a team to define an application profile template and review with the TSG. Team members will be Messrs. Bergamini, Morlon, Drexler, Yamada and Shames.

MC-F00-29 In recognition of the extraordinary and long-term technical contributions made by Mr. Warner Miller, the CCSDS Management Council resolves to award him its highest level of service commendation. The Secretariat is instructed to formulate the citation for review by the Management Council, and to procure a suitable plaque for presentation to Mr. Miller at an opportune time in the near future.

MC-F00-30 The CCSDS resolves to accept the proposal of the British National Space Center (BNSC) to host the Spring 2001 CCSDS Management Meeting in the United Kingdom on June 6-7, 2001.

MC-F00-32 The CCSDS thanks the Brazilian delegate for the offer to host the Fall 2001 meeting in Brazil. A few members noted severe travel constraints in traveling to Brazil, so decision was deferred until the Spring 2001 meeting. An alternate invitation was issued by the United States to host the Fall meeting in Orlando, Florida.

MC-F00-33 The CCSDS thanks NASA and the Laboratory for Atmospheric and Space Physics (LASP) for providing excellent facilities and efficient logistical support, and for being most gracious hosts.

DRAFT ACTION ITEMS
CCSDS Management Council Meeting
November 29-30, 2000

The following new action items were established at this meeting:

F00-A01 In applying for GSCID, INPE has not received acknowledgement that application was received. NASA will confirm whether INPE's application was received. In addition, a system will be established to acknowledge receipt of applications in the future.

Actionee: NASA

DUE Date: January 15, 2001

F00-A02 Provide inputs for new stations and updates to changed stations to the CCSDS Ground Station Green Book. Inputs/updates should be provided to Panel 1E.

Actionee: All Agencies

DUE DATE January 31, 2001

F00-A03 Study additional languages, including XML, for developing a standard language for operational data to enhance interoperability among different application programs used for space craft operations and report at next meeting. Team should also look at end-to-end use and mission life cycle of a standard language. Report on progress of XML workshop.

Actionee: TSG Chair, P3, Yamada, Giaretta, Peccia

Due Date: June 2001 meeting

F00-A04 Prepare an explanation of the changes made to the OAIS Red Book to be included when released for next review.

Actionee: Dr. Giaretta

Due Date: March 2001

F00-A05 Using SCPS software, which has already been approved for international release, as a typical instance, look at any issues related to including such software within their respective distribution systems.

Actionee: BNSC and CNES

Due Date: June 2001 meeting.

F00-A06 Continue to explore constraints on release of software which had been prepared in association with development and testing of CCSDS Recommendations.

Actionee: All members

Due Date: June 2001 meeting

F00-A07 Provide a status report on the STRV testing.

Actionee: TSG Chairman

Due Date: June 2001 meeting

F00-A08 Provide a plan for the 20-year anniversary and submit to the MC.

Actionee: TSG Chairman, with Panel Chairs

Due Date: June 2001 Meeting

F00-A09 Request one-day session on CCSDS at the SpaceOps2002.

Actionee: Secretariat

Due Date: March 31, 2001

F00-A10 Notify P3 Chairman of SLE and SLE Service Management resolutions.

Actionee: TSG Chairman

Due Date: December 7, 2000

F00-A11 Provide material from December workshop for inclusion in Management Council record of Fall 2000.

Actionee: P3 Chairman

Due Date: January 31, 2001.

F00-A13 Redistribute the latest versions of the CCSDS Strategic and Operating Plans for Agency comments.

Actionee: Secretariat

Due Date: January 15, 2001 (Note: Both documents are available on line. URL was provided to MC members via e-mail on January 5, 2001.)

F00-A14 Submit comments on the CCSDS Strategic and Operating Plans to TSG Chairman, Manfred Drexler.

Actionee: All Agencies

Due Date: March 1, 2001

F00-A15 Agencies are encouraged to submit papers for presentation at the IAF meeting in October 2001 in Toulouse.

Actionee: All Agencies

Due Date: As required by IAF

F00-A16 Establish a working group to recommend upgrades and improvement to the existing CCSDS Web Site

Actionee: Secretariat

Due Date: January 15, 2001

F00-A17 Register "CCSDS" in all Internet domains.

Actionee: Secretariat

Due Date: January 15, 2001

Attachment A

Agenda

CCSDS MANAGEMENT COUNCIL
DRAFT AGENDA
Colorado, US November 29-30(AM) 2000

1. Call to Order
2. Introduction of Delegates
3. Welcoming Remarks
4. Agenda Review and Approval
5. Review of Minutes from June 2000 Meeting in Toulouse
6. Secretariat Report
7. Review and Report of Open Action Items
8. Agency Reports
   (Include ManYears of effort and potential resource issues)
9. Summary Reports from Technical Panels
   - Panel 1*
   - Panel 2*
   - Panel 3*
   - TSG
     - Security

   *Chairperson reports should include (1) resource and schedule status, (2) panel documents requiring MC approval, and (3) an identification of which of that panel's products should be considered for submission as future ISO standards.
10. Report from Liaisons & Review of Liaison Relationships
    - IOAG Report
    - IACG WG-4 Report
    - OMG Report
11. Special Topics:
    - Agency Positions on Panel 1E Recommendation on Bandwidth Efficient Modulation
    - Interplanetary Internet Status Report
    - CCSDS Software Programs on CCSDS Web Site
    - Upgrades to CSP and COP
    - STRV Testing
    - Report on S/W Library Planning
12. Any New Business
13. Planning for next Management Council meetings
14. Approval of Resolutions/Action Items
15. Adjourn (12:00 Noon, 30 November 2000)

Attachment B

Closed Actions and List of CCSDS Documents and Status

DRAFT ACTION ITEMS

Enclosure A-3

ISO/TC 20/SC 13 MEETING
June 28, 2000 Toulouse, France

The following actions were developed during the Spring 2000 meeting:

SC-S00-A1 Identify which version of the strategic plan, as distributed in the ISO TC20/SC13 Meetings Materials, is correct and redistribute it for approval.
Assignee: Secretariat
Due Date: July 31, 2000
STATUS: CLOSED - Correct version identified and distributed 29 Sept., 2000.

SC-S00-A2 Comment on the Strategic Plan to be distributed as a result of SC-S00-A1. a
Assignee: All delegates
Due Date: September 15, 2000
STATUS: OPEN - No comments received as of 01 Nov., 2000.

SC-S00-A3 Provide the Secretariat with a list of items needing clarification in the draft Agency Report Template distributed as part of the ISO TC20/SC13 Meetings Materials.
Assignee: All delegates
Due Date: July 31, 2000
STATUS: OPEN - No comments have been provided as of 01 Nov. 2000.

SC-S00-A4 Update the Agency Report Template based on input resulting from SC-S00-A3, above, and distribute for approval.
Assignee: Secretariat
Due Date: August 15, 2000
STATUS: OPEN - Waiting for inputs

SC-S00-A5 Provide electronic copies of presentation materials to the Secretariat.
Assignee: All presenters
Due Date: July 31, 2000
STATUS: CLOSED Electronic copies received from all presenters except CSA.

As of 2000-11-03

CCSDS DOCUMENTS-ISO STATUS (Page 1 of 8)

CCSDS DOCUMENTS with STATUS COMMENTS	CCSDS DATE	CCSDS NUMBER	ISO Number	CCSDS Comment Or ISO DATE
Telemetry Summary of Concept and Rationale`	87-12	100.0-G-1	N/A	N/A
(Determination needed as to purpose of document and then it needs to be rewritten)				
Telemetry Channel Coding	92-05	101.0-B-3	ISO 11754	1999
(Pink Sheeted to correct diagrams, add code options and Frame length --- 07-00)		(101.0-B-4)		
Packet Telemetry	95-11	102.0-B-4	ISO 13419	97-12
(Pink Sheeted to include Internet Packets --- 08-00)				
Packet Telemetry Services	96-05	103.0-B-1	DIS 17433	To Be Published
(Being modified to include IP Packet Services)				(Abram Let'r 05-00)
Lossless Data Compression -	97-05	120.0-G-1	N/A	N/A
Lossless Data Compression	97-05	121.0-B-1	DIS 15887	To be published 00-10
Lossy Data Compression		Green Book		
(ESA is to write a draft White Book)				
Lossy Data Compression		Red Book		
Telecommand Summary of Concept and Rationale	87-01	200.0-G-6	N/A	N/A
(Deing upgraded within CCSDS)				
Telecommand Part 1 — Channel Service	00-06	201.0-B-3	ISO 12171	ISO revision Requested 00-08
(Being upgraded to include TCP/IP, other packets)				
Telecommand Part 2 — Data Routing Service	91-11	202.0-B-2	ISO 12172	(Cover Sheet Approved 00-10)
(Upgraded to carry SCPS-NP&IP Packets in CCSDS frame)	(00-10)	(202.0-B-3)		

As of 2000-11-03

CCSDS DOCUMENTS-ISO STATUS (Page 2 of 8)

Telecommand Part 2.1 — Command Operation Procedures	91-10	202.1-B-1	ISO 12173	98-08
(Gaps in States Marticies discovered, Tim Ray to correct)				
Telecommand Part 3 — Data Management Service	87-01	203.0-B-1	ISO 12174	98-07
(Upgraded to carry SCPS-NP&IP packets in CCSDS frame)	(00-10)			
Proximity-1 Space Link Protocol		211.0-R-3		
(RB-3 to be sent out again for Agency review 08-00				
Overview of Space Link Protocols		G		
Channel Coding and Synch Part 1 (Synchronous)	00-06	131.0-R-1		Release as RB MC - 00-06
Channel Coding and Synch Part 2 (Asnchronous)	00-06	231.0-R-1		Release as RB MC - 00-06
TM Space Data Link Protocol	00-07	132.0-R-1		Release as RB MC - 00-06
TC Space Data Link Protocol	00-07	232.0-R-1		Release as RB MC - 00-06
AOS Space Data Link Protocol	00-07	732.0-R-1		Release as RB MC - 00-06
Communications Operations Procedure 1	00-07	232.1-R-1		Release as RB MC - 00-06
Space Packet Protocol	00-07	133.0-R-1		Release as RB MC - 00-06
Space Link Identifiers		?		
Time Code Formats	90-04	301.0-B-2	ISO 11104	1991
(Reconfirmed for five years 96-06)				(Reconfirmed 1996)
CCSDS GSCID Field Code Assignment Control Procedures	99-05	320.0-B-2	Not applicable	Decision made to not progress document
The Application of CCSDS Protocols to Secure Systems	93-10	350.0-G-0.2	N/A	N/A

As of 2000-11-03

CCSDS DOCUMENTS-ISO STATUS (Page 3 of 8)

Radio Frequency and Modulation Systems—Part 1: Earth Stations and Spacecraft	98-06	401.0-B	Not applicable	Decision made to not progress document
Radio Frequency and Modulation Systems – Earth Stations	97-05	411.0-G-3	N/A	N/A
Radio Frequency and Modulation	92-05	412-0-G-1	N/A	N/A
Radio Metric and Orbit Data	87-01	501 0-B-1	ISO 11103	1996
(Document being updated within CCSDS - exists as draft WB)				
Radio Metric and Orbit Data (Under Development)		Green Book		
Space Data Systems Operations with SFDUs	87-02	610.0-G-5	N/A	N/A
Standard Formatted Data Units—Structure and Construction Rules	92-05	620.0-B-2	ISO 12175	1994
(Reconfirm for five years 99-06)				Reconfirm for 5 years (99-11)
(Corrigendum 1 to Document)	96-11	620.0-B-2/ Cor 1		
Standard Formatted Data Units – A Tutorial	92-05	621.0-G-1	N/A	N/A
Standard Formatted Data Units — Referencing environment	97-05	622.0-B-1	FDIS 15888	To Be Published 00-10
Standard Formatted Data Units — Control Authority Procedures	93-06	630.0-B-1	ISO 13764	96-12
(Reconfirmed for five years 99-06)				
Standard Formatted Data Units — Control Authority Data Structures	94-11	632.0-B-1	ISO 15395	98-03
Parameter Value Language, A Tutorial	00-07	641.0-G-2	N/A	N/A
Parameter Value Language Specification (CCSD0006)	00-06	641.0-B-1	ISO 14961	(Cover Sheet Approved 00-10)
(Document Updated 00-06)		(641.0-B-2)		
ASCII Encoded English (CCSD0002)	92-11	643.0-B-1	ISO 14962	97-12
(Reconfirmed for five years 99-05)				Reconfirmed for 5 years (99-08)

As of 2000-11-03

CCSDS DOCUMENTS-ISO STATUS (Page 4 of 8)

Data Description Language EAST Specification	95-11	644.0-B-1	DIS 15889	To Be Published 00-10
(Pink Sheeted to included EAST extensions --- 00-08)				
Data Entity Dictionary Specification Language (DEDSL) Abstract Syntax	00-07	647.1-R-2		Released as RB 00-09
Data Entity Dictionary Specification Language (DEDSL) PVL Syntax		647.2-R-2		Released as RB 00-09
Data Entity Dictionary Specification Language (DEDSL) XML Syntax		647.3-W-1		00-06 DG -When sufficiently mature to submit to ISO as RB?
Space Systems - Archiving Space Data	99-09	650.0-R-1	CD 14721	DIS Balloting to end 00-11
Advanced Orbiting Systems, Networks and Data Links: Architectural Specification	92-11	701.0-B-2	ISO 13420	97-12
Advanced Orbiting Systems, Networks and Data Links: Audio, Video and Still-Image Communications Services	94-05	704.0-B-1	DIS 15890	Held as DIS – 99-01
Space Communications Protocol Spec (SCPS)—Network Protocol (SCPS-NP)	99-09	713.0-B-1	ISO 15891	Published 00-10
Space Communications Protocol Spec (SCPS) —Security Protocol (SCPS-SP)	99-05	713.5-B-1	DIS 15892	To be Published 00-09
Space Communications Protocol Spec (SCPS) —Transport Protocol (SCPS-TP)	99-05	714.0-B-1	ISO 15893	Published 00-10
Space Communications Protocol Spec (SCPS) —File Protocol (SCPS-FP)	99-05	717.0-B-1	DIS 15894	Published 00-10
CCSDS File Delivery Protocol (CFDP), Introduction and Overview	99-07	720.1-G-5	N/A	N/A
CCSDS File Delivery Protocol (CFDP)	99-06	727.0-R-3	AWI 17355	99-06
Standard Terminology, Conventions and Methodology (TCM) for Defining Data Services	94-11	910.2-G-1	N/A	N/A

As of 2000-11-03

CCSDS DOCUMENTS-ISO STATUS (Page 5 of 7)

Cross Support Reference Model Part 1: Space Link Extension Services	96-05	910.4-B-1	ISO 15396	98-05
SLE Service Management Specification	99-12	910.5-R-1		To RB Review 00-06
SLE Service Management Access Control and Authentication Managed Objects		910.7-W-1.1		
SLE Service Management RF Characteristics Managed Objects		910.8-W-1.3		
SLE Service Management Managed Objects, Formal Specification				
SLE Service Management Implementation Mapping Rules				
Space Link Extension – Return All Frames Service Specification	97-11	911.1-R-2		
Space Link Extension – Return Channel Frame Service Specification	97-11	911.2-R-1.7		
Space Link Extension – Return Space Packet		911.3-R-1.9		
Space Link Extension – Return Operations Control Field (OCF)		911.4-R-1		
Space Link Extension – Return Frame Secondary Header		911.5-R-1		
Space Link Extension – Return Space Packets		911.7-R-1		
Combined SLE Return Services		911-D-1		
Space Link Extension – Forward CLTU Service Spec	00-02	912.1-R-2		To RB Review 00-06
Space Link Extension – Forward Telecommand Frame Service		912.2-R-1		
Space Link Extension – Forward Space Packet Service Spec	99-07	912.3-R-1.9		
Space Link Extension – Forward Telecommand VCA		912.4-W-2		
Combined SLE Forward Services		912-D-1		
SLE Application Program Interface				

As of 2000-11-03

CCSDS DOCUMENTS-ISO STATUS (Page 6 of 7)

ADMINISTRATION DOCUMENT/COMMENT	CCSDS DATE	CCSDS NUMBER	ISO Number	ISO DATE
CCSDS Procedures Manual	05-97	A00.0-Y-7.1	N/A	N/A
CCSDS Strategic Plan	99-12	A01.1-B-1	N/A	N/A
CCSDS Operating Plan	99-12	A01.2-B-1	N/A	N/A
CCSDS Achievements and Products	04-95	A10.0-Y-5	N/A	N/A
CCSDS Leaflet	06-98	A10.1-Y-3	N/A	N/A
CCSDS Related Implementations	11-96	A12.0-G-1	N/A	N/A
CCSDS Glossary	07-97	A30.0-G-3	N/A	N/A
Unique Identification of CCSDS Objects and Services	00-07	A31.0-Y-1	N/A	N/A

As of 2000-11-03

CCSDS DOCUMENTS-ISO STATUS (Page 7 of 7)

OBSOLETED DOCUMENTS	CCSDS Date	CCSDS Number	ISO Number	ISO Date
Advanced Orbiting Systems, Networks and Data Links: Abstract Data Type Library—Addendum to CCSDS 701.0-B-2	94-05	705.1-B-1	Not Applicable	Did not progress to ISO
Decision made to render document obsolete – 99-05				
Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the Path Service and Protocol—Addendum to CCSDS 701.0-B-2	94-05	705.2-B-1	Not Applicable	Did not progress to ISO
Decision made to render document obsolete – 99-05				
Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the VCLC Service and Protocol—Addendum to CCSDS 701.0-B-2	94-05	705.3-B-1	Not Applicable	Did not progress to ISO
Decision made to render document obsolete – 99-05				
Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the VCA Service and Protocol—Addendum to CCSDS 701.0-B-2	94-05	705.4-B-1	Not applicable	Did not progress to ISO
Decision made to render document obsolete – 99-05				

Attachment C

ASI Report

CCSDS MANAGEMENT COUNCIL
October 29-30 2000
BOULDER COLORADO
USA

ASI

Mauro DONATI
ASI (Agenzia Spaziale Italiana)
Viale Liegi, 26,
00198 Rome (Italy)
Phone +39 (06) 8567-343
e-mail: donati@asi.it

ACTIVITY SINCE JUNE 2000

ASI has interests in the subjects of Interoperability, proximity link (UHF and S bands), DSN (Deep Space Network).
In the frame of Mars projects (Space [satellite] and Earth segments [SRT Sardinia Radio Telescope]), whose implementations are already decided by ASI, Italian space firm representative took part in 1E technical subgroup held in October 2000 in TOLOUSE.

ASI is organising Italian firms participation to the CCSDS panels activities, taking into account also the experience and interests of the firms.
In this respect, ASI is receiving requests of some Italian firms involved in Space activities to be informed or to take part to the CCSDS technical panels and subgroups activities.

In October ASI took part in Munchen to the IOAG (Interagency Operations Advisory Group) 2nd meeting (the report of meeting will be given by CNES representative) in which supported the requests to CCSDS that will be presented in this MC meeting as necessary to the IOAG to fulfil the aim reported in his Terms Of Reference (TOR).

As stated in the ESA PARIS June 99 Agencies Interoperability meeting and as said in the last CCSDS TOLOUSE meeting, after a necessary phase of setup, ASI is preparing the technical annex for a study contract giving as result a frame of the compatibility with international standards (CCSDS, Interoperability, Deep Space Network) and activities to do to be interoperable for new designed and some further existing Italian assets selected at the end of the study.
After the conclusion of the study, foreseen by the end of summer 2001, ASI will get detailed information to decide the actions and the schedule to implement the Interoperability concept. ASI is sure that CCSDS Recommendations will be the cornerstone for the Interagency Interoperability.

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Attachment D

BNSC Report

BNSC Report to the CCSDS Management Council 27 June 2000

CCSDS recommendations and their associated ISO and BSi standards continue to grow in importance within the BNSC programmes and we maintain our support to the CCSDS Panels, the TSG and the MC. The BNSC resources are managed under contract by DERA. Overall BNSC staff levels for this work have been approximately 2 staff years per year, including industrial support.

There are resources via a contract with Vega to prototype SLE services within the UK STRV programme. Work has progressed on this during the last year and plans are in place to test various services with the STRV-1c/d pair of satellites, which were launched successfully on 16 November.

BNSC has taken particular interest in Security, the SLE ervices, Archiving standards, Data Interchange software, Turbo Codes and Interoperability.

In November, RAL hosted a special TSG workshop on the future direction of CCSDS, which was attended by about 30 people. In addition, regular panel 1F and panel 2 meetings were also held at RAL around the same time.

Panel 1
The BNSC work here has been concentrated in the areas of the file delivery protocol (CFDP), security, turbo codes and data compression. The BNSC work on the CFDP has continued on testing and evaluation in collaboration with others e.g. GSFC. On security our work has continued with the extension of the Security Green Book to P2 and P3 and participation in "threat" analyses. In addition we are pursuing funding for work on the Interplanetary Internet.

Panel 2
BNSC continues to provide the Panel 2 chairman plus one other active member of this panel. Thus we have contributed to the Red Books for the Archive Reference Model and the DEDSL together with work towards new standards flowing from the archive reference model such as Data Ingestion. The Archive Reference Model has been submitted as a draft ISO standard and the period for comments has recently closed. In addition we have developed software routines to facilitate the implementation of the CCSDS Panel 2 recommendations. This has included the production of Java routines to interface between data objects and coordinating similar work from the other panel members. The Solar Terrestrial Physics Data Facility at RAL has been used as a test bed for these routines and to facilitate demonstration of a system using Java beans to access data descriptions from the Control Authority and process data objects.

Panel 3
As reported previously, DERA has placed a contract with Vega to prototype the SLE services for Return All Frames and Forward CLTU within the UK STRV programme. Work is continuing on the implementation of the managed objects and the database

required for the CLTU service. In addition, work has started on the user MMI. A near-final version of the SLE API arrived at the end of August.

The plan to implement SLE services in the STRV ground segment is progressing. The STRV ground segment consists of the West Freugh station, with the DSN as a backup. RAL is not directly involved in this, contrary to earlier expectations, although RAL are still talking to DERA about involvement in some aspects of the tests.

Presentations at Meetings
A TSG workshop was held at RAL on 7-8 November, which will be reported on elsewhere. Presentations were made by DERA, Logica and Vega.

A meeting for UK industry was scheduled to take place in November, but has been postponed until early next year.

ACE and STRV
The RAL S Band ground station has now provided telemetry capture support to the Advanced Composition Explorer (ACE) mission for nearly three years. This has shown the reliability and good performance achievable with the CCSDS compatible AVTEC decoder system which provides bit synchronization, Viterbi decoding, frame synchronization and Reed Solomon error correction before automatically sending the telemetry frames to the Space Environment Center at Boulder. A near real-time display of the data can be obtained from Boulder at
http://www.sec.noaa.gov/ace/MAG_SWEPAM_24h.html

Future possibilities - the GRID
The UK is investing a considerable amount of money (~£150M) in developing an advanced information technology infrastructure based around the concept of the computational grid. The initial investment will be directed by the Office of Science and Technology and channelled through the six research councils with a coordinating hub to ensure communication between all science disciplines. Within the Space Science community, there are several initiatives developing to greatly improve the access to ability to search distributed archives and to process data held in remote locations. There are specific projects for dealing with the data processing chain for data from ground-based telescopes in remote locations (e.g. Hawaii and Chile) through to the astronomers desktop. This work has a natural connection with CCSDS through the panel 2 activities on archives and the panel 3 work on Space Link Extensions. RAL will be well placed to ensure linkage between GRID activities and CCSDS, being involved in both.

P. Allan, 24 November 2000

[The slides presented at the meeting follow.]

BNSC report to CCSDS MC

29 Nov 2000

Peter Allan

BNSC/RAL

BNSC and CCSDS

- Organisation of BNSC
  - Virtual organisation
    - Head office in London
    - Partners - DERA, RAL, others
- Management of CCSDS work contracted to DERA
  - Tasks done by RAL, Logica, Vega

UK and CCSDS

- Total BNSC resources = 2 staff-years
- RAL provides
  - MC/SC13 representative
  - P2 chair
- P1
  - Logica , SSL, Keltik, Aetheric engineering
- P3
  - Vega

Panel 1 highlights

- Testing of CFDP implementations
  - Workshop at DERA
- Security
- Turbo-codes
- Data compression

Panel 2 highlights

- OAIS reference model
  - Has been through both CCSDS and ISO review
- Java Tools
  - DEDSL
  - "Internet SFDU"

Panel 3 highlights

- Implementation of SLE services by Vega
  - Return All Frames, Forward CLTU
  - Implementation of Managed Objects
  - Work started on user MMI

Other meetings

- Presentations at IAF
- Future Directions Workshop
  - Held at RAL 6-8 Nov
  - Presentations by DERA, Logica, and Vega
- Meeting for UK industry
  - Delayed from November to early next year

Use of CCSDS protocols

- Reception of data from ACE satellite
  - RAL ground station (and several others)
- CCSDS compatible AVTEC decoder
  - bit synchronization, Viterbi decoding, frame synchronization and Reed Solomon error correction
- Real-time data available at
  - http://www.sec.noaa.gov/ace/MAG_SWEPAM_24h.html

New Developments

- GRIDs
- Large investment in IT infrastructure
- Will be applied across all areas of science
- We have specific plans for Space Science and Earth Observation
- Mutual benefit to both CCSDS and GRID work

GRID Developments

- What is the GRID?
  - The next generation web
  - Pervasive computing
  - Provision of powerful computing without knowing location
    - "Behind the wall"
    - Analogy with electric power grid
  - Many things will appear with a GRID label

Example small project

- GRID-enable Starlink data model to provide seemless access to remote data
  - Need to map human specification of data objects on to computer specification
  - Need to locate remote data
  - Need to access remote data
    - Subsetting of remote data

Types of GRID

- Computing GRID
  - High Performance Computing
- Data GRID
  - Easy access to distributed data
- Information GRID
- Knowledge GRID

Who is driving the GRID?

- Particle Physics
  - Needed for "LHC challenge"
- Astronomy
  - Several large new data sources
  - Virtual observatory
- Space Plasmas
  - Coupled real-time models
- Experimental facilities
  - Integration of data acquisition and processing
- Earth Observation
  - Access to distributed data sources
- Climate models
  - Coupled models and large data requirements

GRID activities at RAL

- New e-science centre
  - Incorporate grid into whole of laboratory
  - Plan to be UK grid hub
  - Data portal for whole of laboratory
- Focus of UK Particle Physics developments
- Member of astro-grid consortium
- Involved in EU DataGrid

Attachment E

CNES Report

CNES REPORT
CCSDS MANAGEMENT COUNCIL
BOULDER - NOVEMBER 2000

INTRODUCTION:

-CNES continues providing chairmanship of panel 3 and ISO/TC20/SC13.

-CNES manpower involved in CCSDS activities is about 3 man x year; that is same as previously

NEW IMPLEMENTATIONS AND PRESENTATIONS:

-New decided mini and micro satellites : "COROT" and "Roue Interferometrique", will be compatible with Telemetry and Commands CCSDS recommandations.

-EAST recommandation for data description is or will be used on an operational basis on many projects; among them : SPOT numerical archiv; DORIS on ENVISAT;

-A web site has been opened; giving access to CNES' freeware (among which OASIS and EAST soft) and information

-Presentation meetings of OAIS standard has been performed to potential users, widely extending the space domain, (CNRS, CEA, EDF, ,AIRBUS, ,).
A first application of the model has been made by the Bibliotheque Nationale de France.

CNES ACTIVITIES INTO PANELS:

CNES experts are involved in all panels; but the following could be outlined

- **P1B: Channel coding- Proposal of block turbocodes as a candidate for a future recommendation for channel coding of bandwidth limited missions.**

- **P1C: Image compression- Proposal of CNES wavelet based algorithm as a candidate for future recommendation for image lossely compression. Comparative evaluation of 3 candidate algorithms (NASA/CNES/JPEG2000). Study together with NASA of an hybrid algorithm combining best features of CNES and NASA algorithms.**

- **P1E: Modulation- A recommandation established by CNES with ESA support for modulation (4D-8PSK-TCM) at high symbol rates has been approved and will be submitted to the agencies for approval. Active participation to the panel debats and presentations**

- **P1K: SOIF- After a reference model for S/C on-board interfaces was agreed; CNES organised a panel meeting during which the necessity to complete this model with implementation rules was decided and the possibility of using standard Internet protocol outlined.**

- **Panel 2: Cnes released as red book, for Agency review within mid december,Abstract Syntax of Data Entity Dictionary Specification Language -(DEDSL)- (CCSCS 647.1-R-2) and PVL Syntax of DEDSL -(CCSCS 647.2-R-2). A new version of XML/DTD Syntax of DEDSL -(CCSCS 647.3-W-0.3) has been submitted to P2 in october and should be progressed as red book, by the end of the year.**
  Also an important activity concerning the improvement of the OAIS model and the performance of the EAST tools has been done

- **Panel 3: CNES participates actively to the various working groups. A new issue of the Consolidated Return Services Book - (CCSDS 911 -D-2) has been submitted by CNES to P3. CNES worked also on SLE Management (IDL/GDMO interfaces specifications; mapping on existing technologies)**

Attachment F

DLR Report

DLR Report to the MC

MCREP1100

DLR- GSOC
Status Report to the CCSDS Management Council
Boulder
November 2000

DLR-GSOC continued its work within the reporting period with emphasis on the work of panels P1E, P1J and P3.

1 PANEL 1E

Due to manpower problems, DLR supported P1E in a limited way only. DLR participated at the last P1E-meeting and gave a presentation on the capabilities of the DLR Weilheim Ground Station downlink.
The Weilheim Ground Station is under modernisation in all areas (Front End, Baseband (CORTEX), etc) and uses among other modulation capabilities OQPSK but not FQPSK. A test to run FQPSK data on the Weilheim OQPSK system to analyse the transfer quality therefore was proposed for next year. For this, a NASA FQPSK simulator will be used.

2 PANEL 1J

DLR has done significant work within P1J and proposed a state vector interface for orbit data exchange between the agencies. This replaces the earlier proposed SPK interface, which is not supported by DLR.
In the view of these facts and on the basis of the understanding of the aim of a green book, the white book generated will be continued and completed as a Green Book until November.
In addition, DLR and JPL started the preparation of a new draft red book for orbit data on the basis of the new stat vector agreements. The activity of P1J to target towards a concrete recommendation for the exchange of orbit and tracking data between agencies for cross-support, based on the presently concrete used formats among the agencies, is therefore on the way and shall be completed urgently.

3 PANEL 3

DLR's engagement in P3 was slowed down due to internal manpower
Problems in the past. From December 2000 on, the engagement will be back to normal. DLR leads the P3 subgroup for developing of the transfer
service books. The books needed by the community as stated by the last IOAG meeting (October 2000, GSOC) are on a good track. Besides that, DLR will put more activities on promoting SLE services. A lot of misinterpretations on the use of SLE services were noticed also in the IOAG meeting, which should be clarified by a simple promotion paper.

DLR Report to the MC

As stated already in the past, DLR will implement SLE services as part of its modernization program. This implementation will cover the interface from the control center to DLR's Ground Station as well as the interface for external users.
The ESOC development for Integral, currently under test (joint ESOC/JPL tests) for RAF and CLTU services will act as the basis for this implementation. In the first version management services will not be implemented.

Book review status:
The CCSCS 912.1-R-2: Space Link Extension Forward CLTU Service Specification RB Issue 2, May 2000 is currently under review by DLR. No problems are envisaged and it is expected, that P3 will recommend to the MC to promote the CLTU book to the blue state.
The CCSDS 911.1-R-2: Space Link Extension- Return All Frames RAF Service Specification RB, Issue 2, which also should be reviewed, is not yet available on the CCSDS Home Page and it is expected, that the Secretariat will submit this book for agency review shortly in order to get to the blue state latest at the spring 2001 meeting.
For the RCF document a consistency check with the latest RAF is done at the moment by NASA to allow the submission to the MC as RB-2 as quick as possible.
For the FSP book it is planned to go to the secretariat for RB review end of this year.
DLR produced significant inputs to the Forward Telecommand Frame Service Specification FTCF white book available in RB quality already in May 99 (CCSDS 912.2-R-1.0). The reason why it still is not under review is, that it was decided to be updated following the new issues of FTCF, FSP and RAF and then promoted further.

4 Auxiliary

STRV:
Although DLR has not implemented any SLE software until now (see also the P3 report above) DLR is planning to support the upcomming STRV campaign in a best possible way. We are therefore looking forward for the concrete test plan for the STRV Test (MC-S00-A10) in order to evaluate the degree of participation and to estimate the effort needed. A first check showed, that the Weilheim Ground Station in its capabilities is compatible with the STRV link (link characteristic received from TSG chair).

DLR-GSOC CCSDS Missions:
DLR is active in implementations of control centre software for CCSDS missions in the TM/TC software area, to support routine operations at GSOC. Additional some planned missions, momentarily in a Pre-Phase-C state, which are supported by DLR-GSOC (GALILEOSat, COLUMBUS, some scientific and earth observation missions) are planning to use CCSDS features.
The following GSOC missions either already in orbit or to be launched within the next year are using the following CCSDS features:

DLR Report to the MC

PROJECT	Launch	Uplink			Downlink		
		Packets	Frame	Code	Packets	Frame	Code
CHAMP	In orbit	Y	Y	Y	Y*	Y	Y**
BIRD	5/01	-	-	-	Y	Y	-
EUTELSAT	3/01	Y	Y	Y	N	Y	Y**
GRACE	6/01	Y	Y	Y	Y*	Y	Y**

* : no segmentation
** : no R-S coding
*** : no 1st header pointer for VC-dump

Dr. H. Wanke / M. Drexler

CCSDS DLR/GSOC

Attachment G

ESA Report

Report of ESA delegation
To the CCSDS Management Council
In Boulder (CO, US), 29-30 November 2000

General:
The autumn set of technical panel meetings for this year was arranged to take place in different European locations. These allowed from Europe s side the participation of experts in these meeting, which otherwise could not have participated. This contributed certainly to the overall awareness and acceptance of CCSDS and its recommendations.
Again, ESA is pleased to note that considerable progress was achieved during those meetings. It is quite positive to note that the trend for more actual implementation tests between agencies is picking up momentum, thus ensuring that proposed recommendations will really be interoperable. Particularly positive to note is the fact, that for the case of the CFDP tests, four different ground implementations were actually tested. Evaluating the soundness of the proposed recommendations via actual implementations in an international interoperable environment has significantly enhanced the quality of the recommendation.
Judging from the activities presently going on within CCSDS and estimating required effort for future work confirms the observation that the semi-annual frequency of meetings will still be required for quite some time. If any longer time frame is considered, it could have negative delaying impact.

Support by ESA to CCSDS panel work:

ESA continues to be committed to support actively all panels, subpanels and working groups of CCSDS. ESA is directly involved in the production of all major books. Several key players from ESA within the CCSDS technical management (panel and subpanel chairs or comparable functions) keep ensuring that technical progress is maintained. ESA will also ensure continuity for the panel 1 chairmanship and will also support the new structure of panel 1 with the 7 subpanels.
Presently, from ESA more than 15 staff work directly on preparation of CCSDS recommendations and a total of about 5 man-years is spent on CCSDS related standardisation activities internally, in addition to work by contractor staff.
The implementation activities of systems linked to CCSDS recommendations (as e.g. SLE) constitute also considerable resources.
These activities are further supported by studies directly covering CCSDS subjects and preparation of recommendations. These studies include work for efficient modulation schemes, work on turbo codes, on SLE (API specification, SLE provider gateway), validation of COP 1 protocols and simulation of use of CCSDS recommendations versus COTS IP technology. The outcome of those studies in turn will support the technical panel work and may eventually lead to new recommendations.
The recent set of technical panel meetings included the following sessions:
- in October and the first part of November 2000, the Panel and Subpanel meetings in Villafranca (Spain), in Toulouse (France) and at RAL (UK).

Implementations of CCSDS recommendations:

ESA is actively continuing its policy to implement CCSDS recommendations. As stated several times ESA's standardisation plan foresees the application of CCSDS recommendations for basically all future missions in the area of Space Communications and consequently, the ground infrastructure is being upgraded to support the corresponding needs. Currently, the ground infrastructure is capable to support CCSDS compatible missions up to the link layer (i.e. including packet TM/TC). Present and future implementations cover and will cover progressively SLE services and higher layers.

ESA considers implementation of CCSDS recommendations will get even more attention in the near future. In increasing numbers participating agencies and industries will have implemented the corresponding CCSDS recommendations, and therefore cross support activities will be much easier and more economic, than in the past. ESA has established recently by its Engineering Standards Board (ESB) a table of Space Communications Standards applicable for its space missions. These standards cover all key CCSDS recommendations and are foreseen to become European standards within the ECSS system; they will then consequently be also most European Space Agencies and European industry.

Observations to work of technical panels:

Considering the limits on available resources for standardisation work globally, ESA notes with satisfaction that considerable progress was achieved in nearly all areas and many agreements could be reached.

It is quite positive to see that within the RF&Modulation area, work on bandwidth-efficient Modulation schemes and Coding was treated with priority and a solution was found for the problems we faced last time, namely the issue of licensing, for newer bandwidth-efficient methods. For the future, clear procedures should make sure, that technical panel meetings do not suffer from legal and patent discussions. It was very important that special steps had been taken to find solutions for the ever-increasing problem of congestion in the frequency band allocated to space.

In this context it would be wise to consider, that in future application of already existing technology (and hence existing patent rights) may have to be take place more frequently than until now, and ESA suggests that CCSDS needs therefore to address this question.

The recent plans for interoperability tests using the STRV spacecraft of DERA are supported by ESA on several levels. They are considered as an important step to demonstrate to the world the usefulness of CCSDS work.

At this occasion ESA wishes to congratulate DERA/BNSC to the successful launch and to the fact that the SPARC computer was already successfully booted and first tests could start.

In this context ESA notes with satisfaction, that progress was also achieved on the definition of exchange of spacecraft flight dynamics data within subpanel 1J.

The easy and standardised exchange of navigation and tracking data will contribute to simpler cross support operations between different agencies in the future.

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Attachment H

INPE Report

INPE Report
to the
CCSDS Management Council
Boulder, CO, USA
28-29 November, 2000

The continuing support of INPE as a Member of the Consultative Committee for Space Data Systems (CCSDS) is reaffirmed in this opportunity.

Recognizing the precedence of BNSC in the process, INPE understands that its renewed invitation to CCSDS and ISO/TC20/SC13 for holding the Technical Steering Group (TSG), Management Council (MC) and the SC13 meetings in Brazil, in May of 2001 can not be corresponded, although the next Plenary of the SC14/TC20/ISO meeting will be held, at Sao Jose dos Campos, in Brazil, in the same (May) occasion. Therefore, a renewed invitation by INPE is being addressed to CCSDS and ISO at this current meeting, for the realization of the October/November 2001 CCSDS TSG and MC and SC13/TC20/ISO meetings in Sao Jose dos Campos, Brazil.

INPE is pleased to announce that :

- The first request for a 'GSCID Assignment' has just been placed by INPE with the 'World Data Center A for Rockets & Satellites', for the 'French-Brazilian Microsatellte (FBM)'. The pertinent request for inclusion of the satellite logo in the 'CCSDS Fleet' poster has also been made to the CCSDS Secretariat;

- There are indications that INPE is interested in an opportune upgrading of its Ground TT&C Stations toward their capability for the cross support of external services. It is also possible that the opportune inclusion of SLE Servicing capability may be considered in this process;

- The increasing involvement of INPE participation in the ISS Program is a concrete promising front for application of CCSDS based Recommendations;

- The involvement of technical experts by INPE as part of the many CCSDS Technical subpanels is gradually increasing , in parallel with their increasing commitment as members of the Brazilian Working Group (Commission of Studies CE 08:001.06) on 'Space Data and Information Systems' of ABNT , which is the main National body for standardization.

Eduardo W. Bergamini
INPE Principal Delegate to CCSDS

Sao Jose dos Campos, November 2000

Attachment I

NASA Report

CCSDS Management Council: NASA Report

University of Colorado, Boulder, Colorado, USA, 29-30 November 2000

Adrian J. Hooke

Organizational Status

At NASA-Headquarters, Mr. Jack Kelley has now replaced Mr. Dave Townley, who retired from NASA last July. In the interim period, we sincerely thank Mr. John Rodgers for so ably standing-in during the transition. At NASA-JPL, Mr. Merv MacMedan s retirement is complete and Mr. Peter Shames is now fully active as the JPL Standards Manager. At NASA-Goddard, Mr. Felipe Flores-Amaya has taken over the overall management of that center s standards activities. With these changes, NASA is now once again up to strength in terms of its management team.

Budget

The core standardization NASA budget remains level at an annual value of approximately $2.4M with an additional $1.0M being contributed by various other NASA sources. The total funding envelope translates into approximately 2 full time equivalent NASA Civil Service employees and 13 full time equivalent NASA-JPL and Contractor staff. Modest augmentations to the JPL budget were made, starting in October 2001. In addition, several small extra sources of funding were found to cover planning for the flight test activities on the STRV 1D spacecraft. During the coming six months, we expect to see increased attention being paid to the NASA Standards program as new architectural studies begin to form.

US Department of Defense (DOD) Use of CCSDS Standards

As noted at the last meeting, NASA has, for some time, been participating with other U.S. government agencies - both civilian and military - in an effort to develop an integrated satellite operations architecture to support consolidated agency requirements. Two areas targeted for attention under this architecture are:

1. Pursuit of open architectures and commonality across similar space systems or missions using common protocols and standards where appropriate; and
2. Implementation of spectrum efficient waveforms. The full extent of the implications of this cooperative effort will be better understood as the transition planning, now being initiated, evolves.

A Satellite Operations Transition Plan is in the final stages of approval, which will detail how standards will be developed and deployed for future national space missions. In addition, in another DOD community the Range Commanders Council is in the process of baselining CCSDS Packet Telemetry for use on aircraft and missile test ranges. These are important activities for CCSDS. If this large DOD community adopts CCSDS standards, the customer base will be greatly expanded. Consequently, the size of the market for standard products will increase and a larger number of commercial implementations may be expected. On the other hand, the DOD is understandably concerned aboutw orking with an organization whose charter includes a preamble about being for exclusively peaceful purposes . NASA hopes that the other CCSDS agencies will recognize these concerns and make suitable accommodations.

Consolidated Space Operations Contract (CSOC)

The NASA Standards program continues to maintain cordial relations with the contractor, who participates in CCSDS-related meetings.

Deployment and Application of CCSDS

NASA is pleased to note that we believe that 155 spacecraft are now committed to using CCSDS recommendations (an increase of 4 since the last meeting). Mr. Tom Gannett continues to maintain an excellent online database of this information, http://hope.gsfc.nasa.gov/ccsds/implementations/. This

material is periodically printed as an excellent CCSDS marketing brochure for distribution at major external events and another publication run is now in progress.

Flight Test: Space Technology Research Vehicle

In cooperation with the UK Defence Evaluation Research Agency (DERA), NASA continues its preparation to conduct a flight test of the SCPS and CFDP protocol suite onboard the STRV 1D spacecraft, which was launched on an Ariane-V on 15 November. NASA participated in the TSG Future Directions workshop at RAL on 06-08 November, during which several other CCSDS agencies indicated strong interest in joining the STRV 1D flight tests.

Exploratory Relationships with the OMG

NASA continues to actively work with the new Space Task Force that has been established within the Object Management Group (OMG), an independent consortium of over 800 companies that is dedicated to creating open standards for information exchange among distributed applications. A full report on this activity will be given separately by Mr. Peter Shames.

Standard Data Objects

NASA's Formats Evolution Process Committee, under the chairmanship of Don Sawyer, has released a draft for science community review that describes a possible standard time series object. If there is favorable review, this could become a CCSDS/ISO standardization effort.

Spacecraft Onboard InterFaces (Subpanel 1K)

NASA continues to vigorously support the SOIF activity by contributing towards the Reference Architecture. NASA-JPL has also secured technology funding to conduct prototype evaluations of Spacewire and Firewire networks.

Conferences, Workshops and Open Meetings

A. NASA staffed the CCSDS booth at the 2000 International Telemetering Conference in San Diego from 23-26 October. This conference is a premier event for the telemetry community. The exhibit areas spanned two huge ballrooms and a tent. A large number of the other exhibits featured suppliers producing CCSDS-compatible equipment. The CCSDS booth was well positioned close to an entrance. CCSDS personnel were on their feet almost continuously, talking to a steady stream of people wanting to find out about CCSDS. In addition to verbal information, three products were disseminated:

   i) The CD-ROMs containing all of the CCSDS Standards. About 500 of these were given away.
   ii) The product brochure listing the missions and commercial CCSDS implementations. About 250 of these were handed out.
   iii) The "CCSDS Fleet" poster, photo-printed in high quality glossy color in 30-inch x 50-inch format. About 250 were given away.

   In addition, Avtec Systems Inc. - on their own funds - produced an excellent little "Pocket Guide to CCSDS" containing flip-through details of the key CCSDS data structures. For the second year they also gave a very well attended 'Introduction to CCSDS' class.

A. Don Sawyer or Lou Reich presented the OAIS Reference Model in various fora:

   i) CENDI, the US Federal Science and Technical Information Manager's Group meeting, held in Washington D.C., June 2000.

ii) Federal Deposit Library Conference invited presentation, held in Arlington, VA, 22-25 October 2000.

iii) CODATA, invited presentation, International Council on Scientific Union's Committee on Data conference held in Baveno, Italy, 16-20 October 2000.

A. Adrian Hooke delivered a presentation on the Interplanetary Internet and CCSDS work at the 2000 International Symposium on Advanced Radio Technologies , held on 06 -08 September in Boulder, Colorado.

-o-o-o- end -o-o-o-

Attachment J

NASDA Report

NASDA REPORT to CCSDS / MC (November 29 - 30, 2000 at Boulder)

1. Management

1-1 : Organization / Changes

Mr. Mito was replaced as NASDA delegate to SC13 by Mr. Kuramasu.
NASDA requests to change the registered name of head of delegation accordingly.

Agency Web Site: http://www.nasda.go.jp/

Head of Delegation and Agency Representative for Spacecraft IDs
Postal Address:
Mr. Ryouichi Kuramasu
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Satellite Mission Planning Dep. of Office of Satellite Systems is responsible organization in NASDA . NASDA reactions to CCSDS outputs are coordinated in the Space Data System Committee which consists of about 25 members from several NASDA Offices, such as Transportation, Space Station, Earth observation Satellite Systems and so on.

1-2 : Areas of Agency Involvement

Participating in three Panel activities. Because of manpower shortage we could not send NASDA staff to sub-panels (P1A , P1B, P1C and SOIF).

Further details ;

< Panel 1>

- Document review :
  - Proximity-1 Space Link Protocol : No comment
  - Telecommand Part-1 – Channel Service : No comment
  - Packet Telemetry : No comment

- NASDA CFDP Software : Modified
- NASDA CFDP Tester : Released
- Study on CFDP Inter-Agencies Testing (See 2. Implementation activities.)

<Panel 2>

- Document review :
  - Data Description Language EAST Specification : completed
  - Data Dictionary Specification Language Abstruct Syntax : on going
  - Data Dictionary Specification Language PVL Syntax : on going

<Panel 3>

- Document review :
  - Space Link Extension Forward CLTU Service Specification : some comments
  - Space Link Extension - Service Management Specification : some comments

1.3 : Task and Manpower allotment within NASDA.

Ryouichi Kuramasu : Head of Satellite Mission Planning Dep. and CCSDS related activities

TSG/MC/ISO Hideo Hara (Coordination of Engineering matter and external affairs and supporting SC-13 National Committee of Japan)

Panel 1 Toshio Kikuchi (P1A and P1K)
Kazuo Nakada (P1E)
Yoshitaka Taromaru (P1F supporting SC-13 National Committee of Japan)
Mikio Sawabe (P1J)
Shiro Yamakawa (Optical comm. W.G.)
P1B and P1C : TBD

Panel 2 Yoshio Inoue (Supporting SC-13 National Committee of Japan)

Panel 3 Mitsuhiko Fuda / Koichi Shinohara

Contract CFDP, RF and Modulation, Secretary : Approx. several man months in total

Total manpower has kept approximately 2 persons / year. None is exclusively dedicated to CCSDS activities.

2. Implementation activities

2-1 : Spacecraft Utilizing SC-13 Standards

- ADEOS-II (Earth Observation Satellite; Launch in Feb. 2002)
  Only downlink science data is packetized
- JEM (Space Station; Launch in 2002)
  Uplink AOS / Downlink AOS

- HTV (H-2 Transfer vehicle; Launch in 2003)
  Uplink Telecommand / Downlink AOS
- ETS-VIII (Engineering Test Satellite; Launch in 2003)
  Uplink Telecommand / Downlink AOS
- ALOS (Land Observation Satellite; Launch in 2002)
  Uplink Telecommand / Downlink AOS
- SELENE (Selenological & Eng. Explorer; Launch in 2004)
  Uplink Telecommand / Downlink AOS

STRV interoperability testing :

We are requesting additional resources to facilitate CFDP internet testing in Feb. 2001 time frame. This test is prerequisite to join in the STRV-1D CFDP festival.

(1) Internet-in-Space-over CCSDS(SCPS) : ------ No SCPS application

(2) CFDP-over-CCSDS : ------ Only one potential test mode

(3) CCSDS packet TLM/TC interoperability testing : ----- No packet TLM processing ability

(4) SLE service testing : ------ No SLE processing ability

2-2 : Ground Facilities Utilizing SC-13 Standards

< S-band ground network for Space operation >

* Locations of operational ground stations :

- Katsuura in Kanto area near Tokyo : 2 systems
- Masuda near the H-2 launch site in Tanegashima : 2 systems
- Okinawa in Okinawa island in southern end of Japanese archipelago : 2 systems

  Those RF systems in stations will be replaced by newly developed H/W.
- Kiruna in Sweden : 1 system

* Development of the next generation ground stations that can ope with the CCSDS recommendations have entered on manufacturing phase.

Up link : CCSDS Telecommand, Down link : CCSDS AOS, Range : Tone

Locations of new ground stations :

- Katsuura in Japan
- Masuda in Japan
- Okinawa in Japan
- Kiruna (will be upgrade)
- Perth
- Santiago
- Maspalomas

These stations will enter into operational phase by April first of 2002. Each station will equip 1 RF system. NASDA has no plan to use Packet Telemetry standards in our Space and Ground networks.

< Space Network >

* CCSDS packet data processing equipment (both high rate and low rate) is now under development. This equipment will be installed in the DRTS (Data Relay Test Satellite) BBE located in Tsukuba Space Center and Hatoyama Earth Observation Center.

* Also low rate CCSDS packet data processing equipment will be installed in the ARTEMIS utilization system BBE located in ESA Redu station.

3. Documentation activities

3.1 : Agency adoption of SC-13 Standards

3.2 : Translation Activities

We decided to use the original English version as it is.

4. Technical activities

4.1 : Status of action items

Old A/I number	**Description**	**Status report**
	None for NASDA	
New A/I number	**Description**	**Status report**
MC-S00-A 08	On-line SW license agreement	So far no comment. Need further check by specialist when operation condition becomes explicit.
MC-S00-A 09	Site to host on-line SW library	See appendix A
MC-S00-A 13	Tracking stations that can participate in STRV interoperability testing	No NASDA station is able to participate in the test
MC-S00-A 15	Idea for 20-year anniversary plenary meeting	In the U.S.A.
MC-S00-A 17	Requirements regarding the terms necessary for accepting patents as part of CCSDS Recommendations	See appendix B

4.2 : Status of on-going assignments

None

4.3 : Status of Liaison activities

5. Conclusions / Issues

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Attachment K

ISAS Report

ISAS Report, November 2000

ISAS REPORT TO CCSDS MANAGEMENT COUNCIL

Univ. of Colorado, Boulder, USA, November 29-30, 2000

Takahiro Yamada

1. IMPLEMENTATION OF CCSDS RECOMMENDATIONS

1.1. ONBOARD

Spacecraft	Mission	Launch Year	TLM Pkt	TLM Frm	TLM Code	TC Pkt	TC Frm	TC Code
PLANET-B	Mars orbiter	1998		✔	✔			
ASTRO-E ✞	X-ray telescope	2000	✔	✔	✔			
MUSES-C	Asteroid sample return	2002	✔	✔	✔	✔	✔	✔
LUNAR-A	Lunar penetrators	2003		✔	✔			
ASTRO-F	Infrared telescope	2004	✔	✔	✔			
ASTRO-E-II	X-ray telescope	2005	✔	✔	✔			
SOLAR-B	Solar observatory	2005	✔	✔	✔			

1.2. GROUND

Complex	Function	TLM Pkt	TLM Frm	TLM Code	TC Pkt	TC Frm	TC Code
SSOC	Spacecraft Control Center	O	O	-	O	O	O
KSC	Ground Station (Near Earth)	O	O	O	U	U	-
UDSC	Ground Station (Deep Space)	O	O	O	U	U	-

O: Operational, U: Under development

ISAS plans to use SLE (RAF and CLTU) services for data transfer between ISAS and JPL for MUSES-C. ISAS also plans to use file-based SLE Service Management for MUSES-C.

2. PANEL ACTIVITIES (From May 2000 to November 2000)

2.1. PANEL 1

- The following seven White Books edited by ISAS were approved for publication as Red Books at the MC meeting in June 2000:

  Space Packet Protocol,
  TM Space Data Link Protocol,
  TC Space Data Link Protocol,
  AOS Space Data Link Protocol,
  Communications Operation Procedure-1 (COP-1),
  TM Synchronization and Channel Coding,
  TC Synchronization and Channel Coding.

- ISAS edited the following White Book, which was submitted to Panel 1 for publication as a Red Book:

  Space Link Identifiers.

- ISAS is editing the following Draft Green Book:

  Overview of Space Link Protocols.

- ISAS plans on editing the following two Draft Green Books:

  Space Packet Protocol,
  Space Data Link Protocols.

- ISAS reviewed the Pink Sheets for the Packet Telemetry Blue Book and submitted comments.

2.2. PANEL 3

- ISAS plans on editing a White Book on a mapping rule for SLE Service Management to be used for file-based Service Management.
- ISAS also plans on editing an introductory material for file-based Service Management.

2.3. Technical Steering Group (TSG)

- ISAS supported activities of TSG by giving presentations on the status of restructuring of Panel 1 documents.
- ISAS made a proposal for developing a standard language for operational data to enhance interoperability among different application programs used for spacecraft operations. A concept paper will be generated by the next meeting if this proposal is accepted.

2.4. Management Council (MC)

- ISAS supported activities of MC by presenting a status report on the activities at ISAS.

3. STUDY ACTIVITIES

3.1. Internet-based Space Data Systems

ISAS has realized that many people (in particular, instrument people) are interested in using Internet technology for their future missions, and will start a study activity on Internet-based space data systems. The first topic will be Internet-compatible routing and addressing mechanisms needed to support space missions.

4. OTHER ACTIVITIES RELATED TO CCSDS

4.1. the Interagency Operations Advisory Group

ISAS supports the activities of the Interagency Operations Advisory Group (IOAG), and is an active member of the Working Group on service management.

4.2. Interagency Consultative Group

ISAS supports the activities of the Interagency Consultative Group (IACG), and is an active member of Working Group 4 which discusses interoperability issues.

5. AVAILABLE MANPOWER RESOURCES

Only one person is available at ISAS to support CCSDS, and he does this work on a part-time basis. The manpower available to support CCSDS in this year (2000) is roughly 1/3 man-year.

Attachment L

IACG Working Group 4 Briefing

by ISAS/Takahiro Yamada

Inter Agency Consultative Group (IACG) - Working Group 4

Terms of Reference and Recommendations to CCSDS Management Council

IACG WG-4 Terms of Reference (Original)

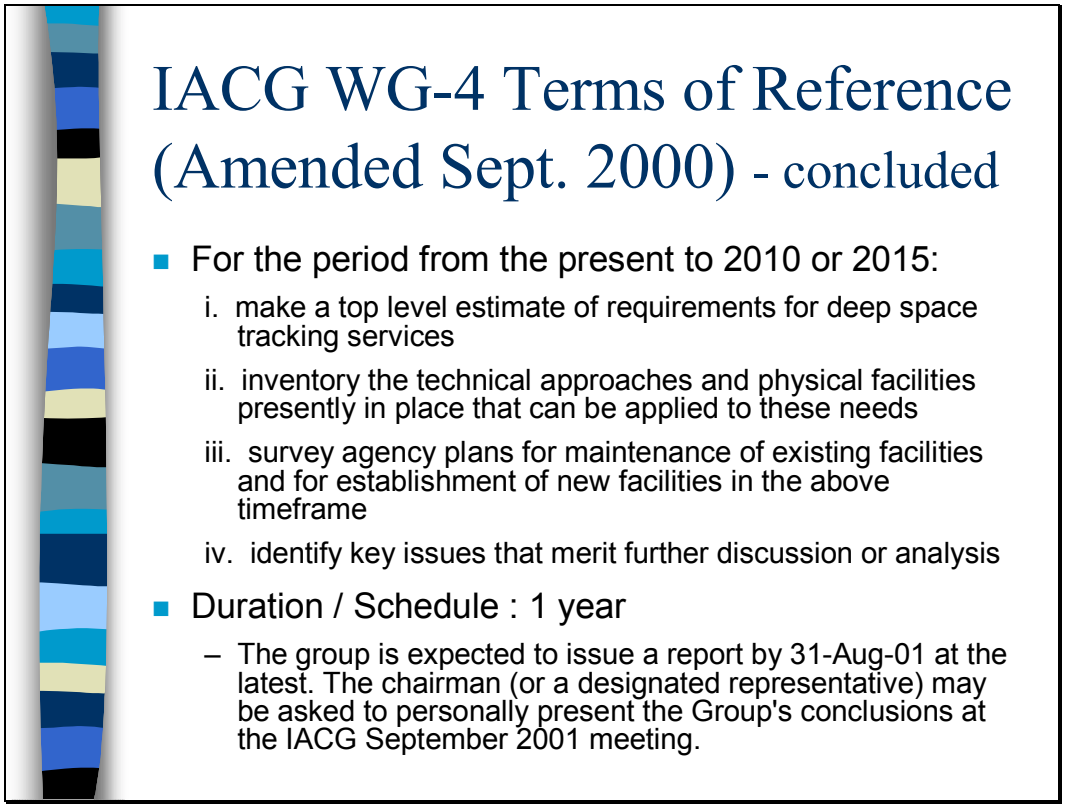
- Study interoperability issues in particular with respect to tracking, telecommanding, telemetry data acquisition systems, as well as frequency band utilisation;
- Recommend specific actions needed to facilitate cross-support of one agency's spacecraft by another agency's support facilities;
- Draw on the technical work already completed by other organisations developing standards for space systems such as CCSDS and SFCG;
- Develop a recommendation, for approval by the IACG, for a coordinated and phased implementation program to achieve the interoperability objectives.

IACG WG-4 Terms of Reference (Original) - concluded

- The WG shall perform its tasks in the following steps with respect to forthcoming scientific missions:
  1. Assessment of relevant Earth orbit and deep space facilities of the four agencies envisaged for cross-support including their applicable frequency bands.
  2. Assessment of the status and planning of the relevant recommendations of the CCSDS in the near and long term.
  3. Definition of goals for interoperability of near-term missions (e.g. Integral).
  4. Identification of required enhancements for science missions in the medium/longer term (e.g. Mars missions). This shall address frequency band utilisation with the aim of a coordinated approach for ground and space segments.

IACG WG-4 Terms of Reference (Amended Sept. 2000)

- The Delegations surveyed the respective future plans and noted that with a view at the number of large facilities and observatories planned or envisaged by the member agencies in the next decade, there appeared to result an increasing load on, and demand for, ground tracking and data acquisition facilities.
- The Heads of Delegation resolved to request the IACG WG-4 to make an analysis of this issue and to report to the next meeting of IACG in 2001.


IACG WG-4 Terms of Reference (Amended Sept. 2000) - concluded
For the period from the present to 2010 or 2015:
i. make a top level estimate of requirements for deep space tracking services
ii. inventory the technical approaches and physical facilities presently in place that can be applied to these needs
iii. survey agency plans for maintenance of existing facilities and for establishment of new facilities in the above timeframe
iv. identify key issues that merit further discussion or analysis
Duration / Schedule : 1 year
– The group is expected to issue a report by 31-Aug-01 at the latest. The chairman (or a designated representative) may be asked to personally present the Group's conclusions at the IACG September 2001 meeting.

Attachment M

IOAG Briefing

by CNES/Roland Ivarnez

CCSDS MANAGEMENT COUNCIL
Boulder
November 2000

Interagency Operations Advisory Group (IOAG) REPORT

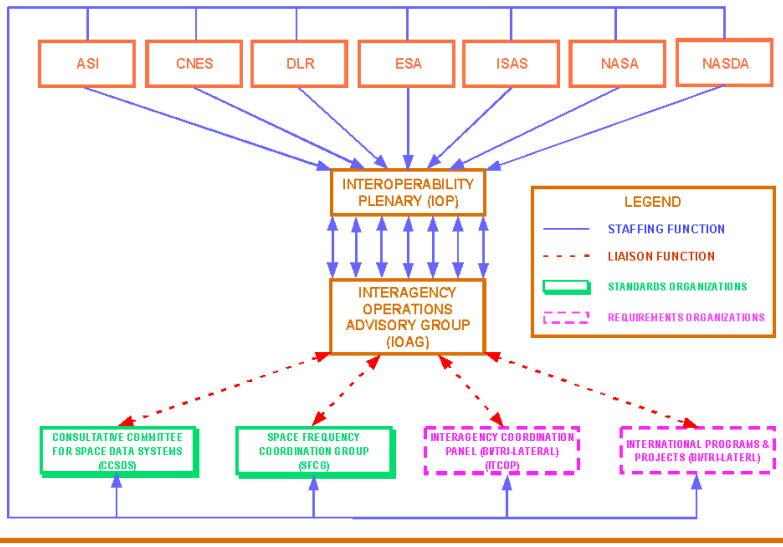
R. Ivarnez

MC Fall 2000 - IOAG Report

20/04/2001

RI 1

FIGURE 1: ORGANIZATIONAL RELATIONSHIPS



MC Fall 2000 - IOAG Report

20/04/2001

RI 2

IOAG REPORT

- The second Interagency Operations Advisory Group (IOAG) was held at DLR on 4 and 5 October 2000.
- Two Liaison Statements to CCSDS Management Council have been drafted

MC Fall 2000 - IOAG Report

20/04/2001 RI 3

Liaison Statement 1 from IOAG to CCSDS MC

Based upon a review of all of the information, the IOAG invites the CCSDS Management Council to take the following actions to expedite adoption of services application Blue Books:

- Request CCSDS Panel 3 to devote all of its efforts toward finalizing and adopting the CLTU, RAF, and RCF Blue Books and direct the postponement of all other work (e.g., specifications for SLE Service Management and other SLE Transfer Services) having the potential to delay or to require resources which can be used to achieve this objective.
- Make a recommendation to CCSDS Panel 3 that SLE Application Program Interface (API) Blue Books be based upon the ESA/NASA Integral implementation specifications.

MC Fall 2000 - IOAG Report

20/04/2001 RI 4

While examining the list of missions, an issue arose regarding the degree of CCSDS compliance. The IOAG was informed that the CCSDS maintains a chart showing missions, who are "CCSDS compliant", but it was noted that this chart did not provide the details of such compliance.

The IOAG believes that a list of present and future missions, showing compliance with each of the several CCSDS Recommended standards and their various options, would be of great value to the CCSDS. Such a list will encourage equipment manufacturers to build and market CCSDS compliant hardware, which would facilitate interoperability. Therefore :

- The IOAG recommends that the CCSDS conduct a survey and compile a list of missions showing which CCSDS recommended standards, both existing and those under development, together with the options available with each standards, are in use or will be in use by 2005 by member and Observer agencies. This list should be maintained and updated periodically.

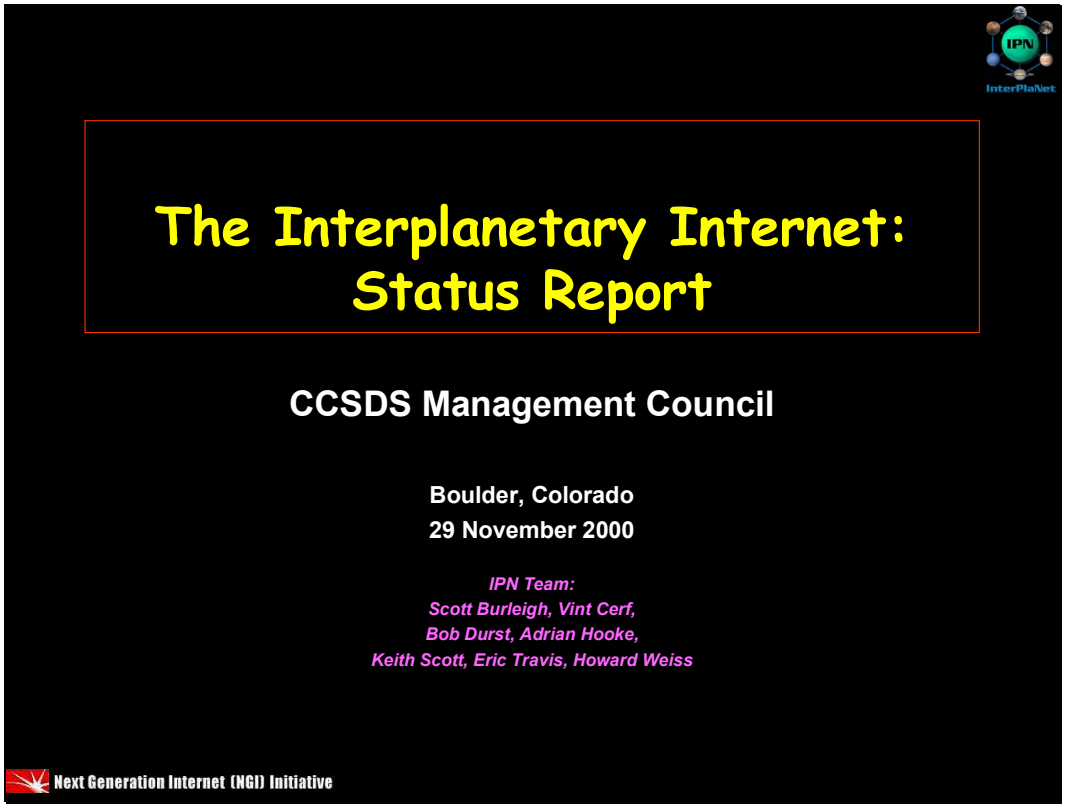
MC Fall 2000 - IOAG Report

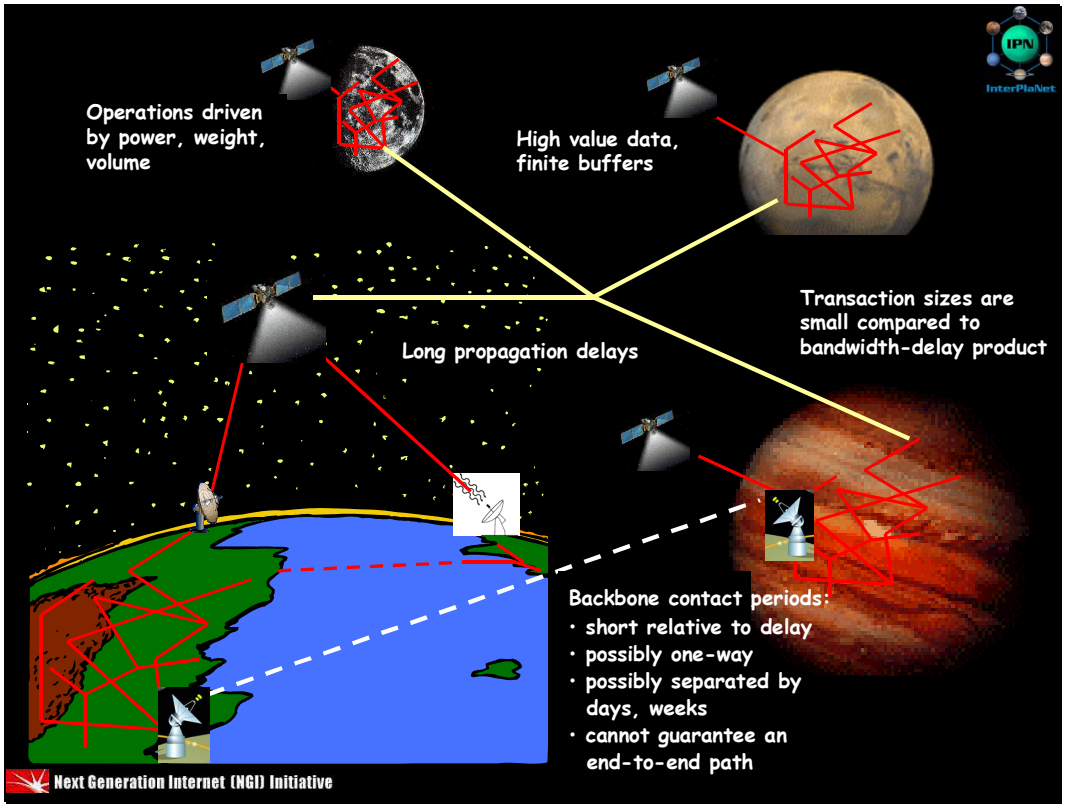
20/04/2001 RI 5

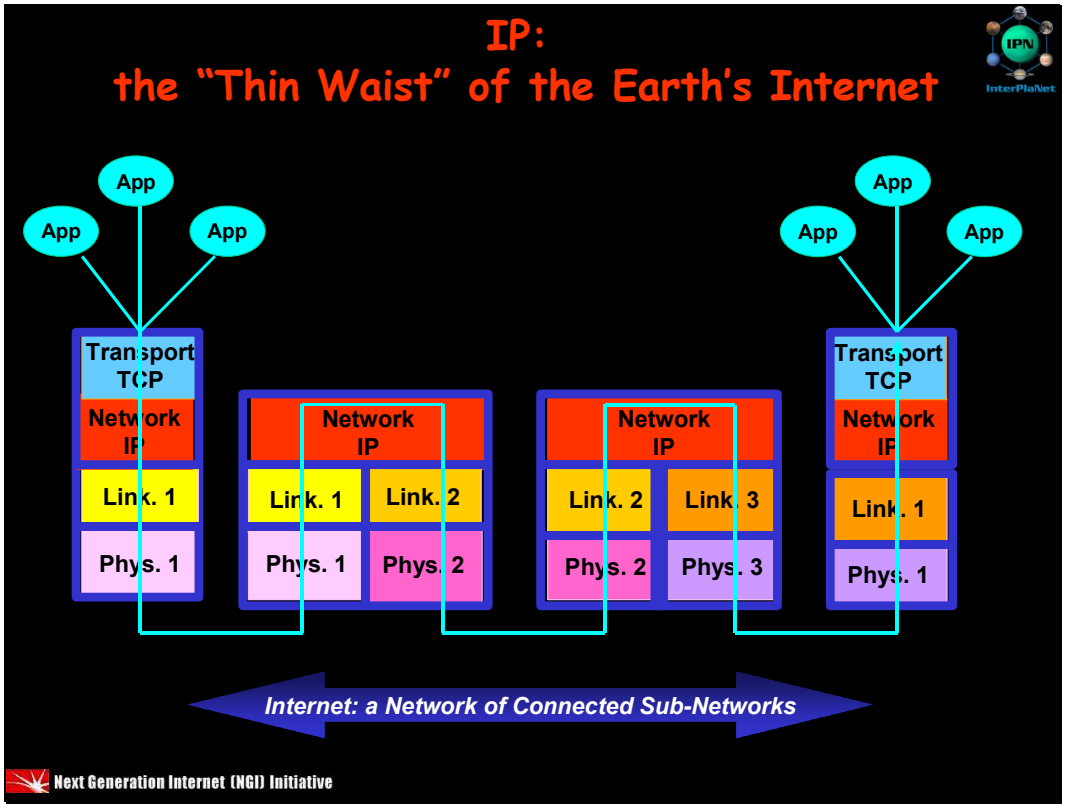
Attachment N

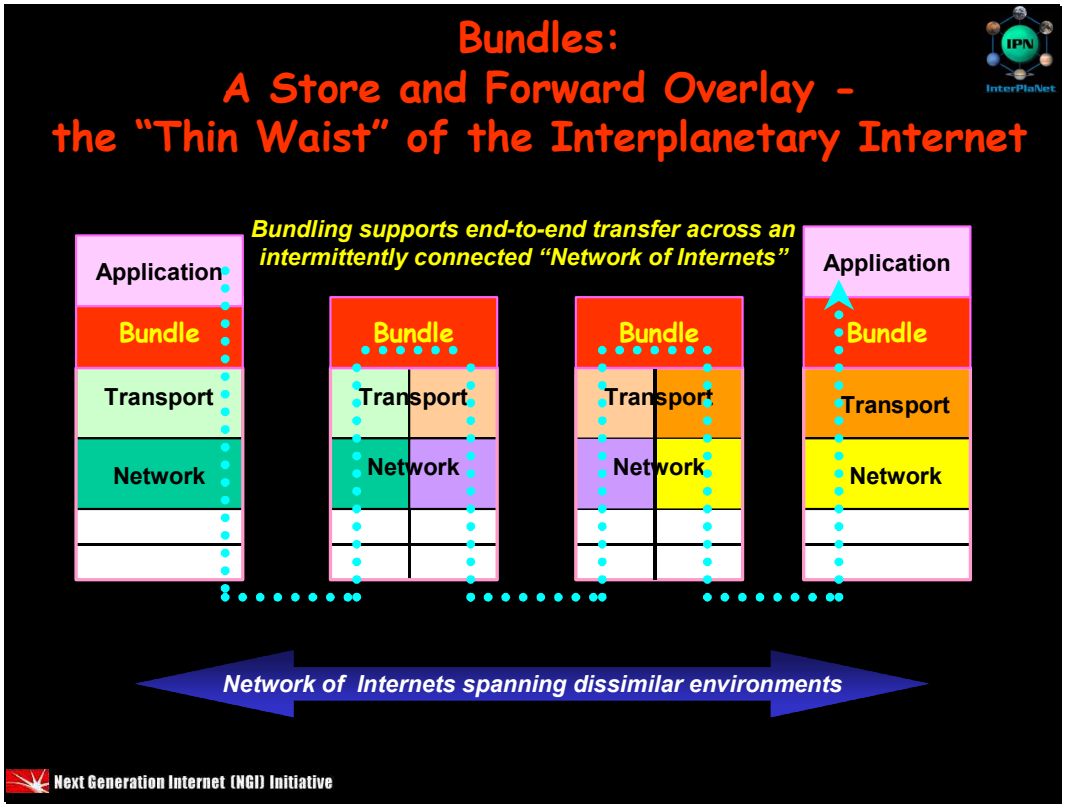
Interplanetary Internet Status Report

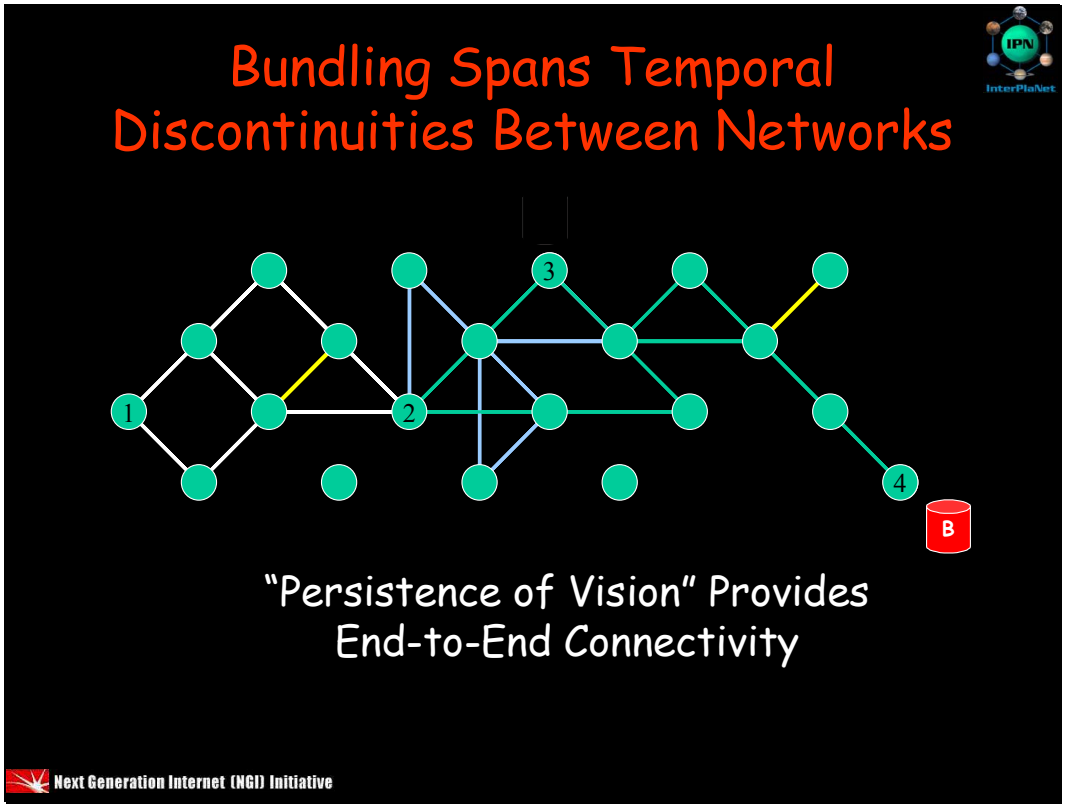
by NASA/Adrian Hooke

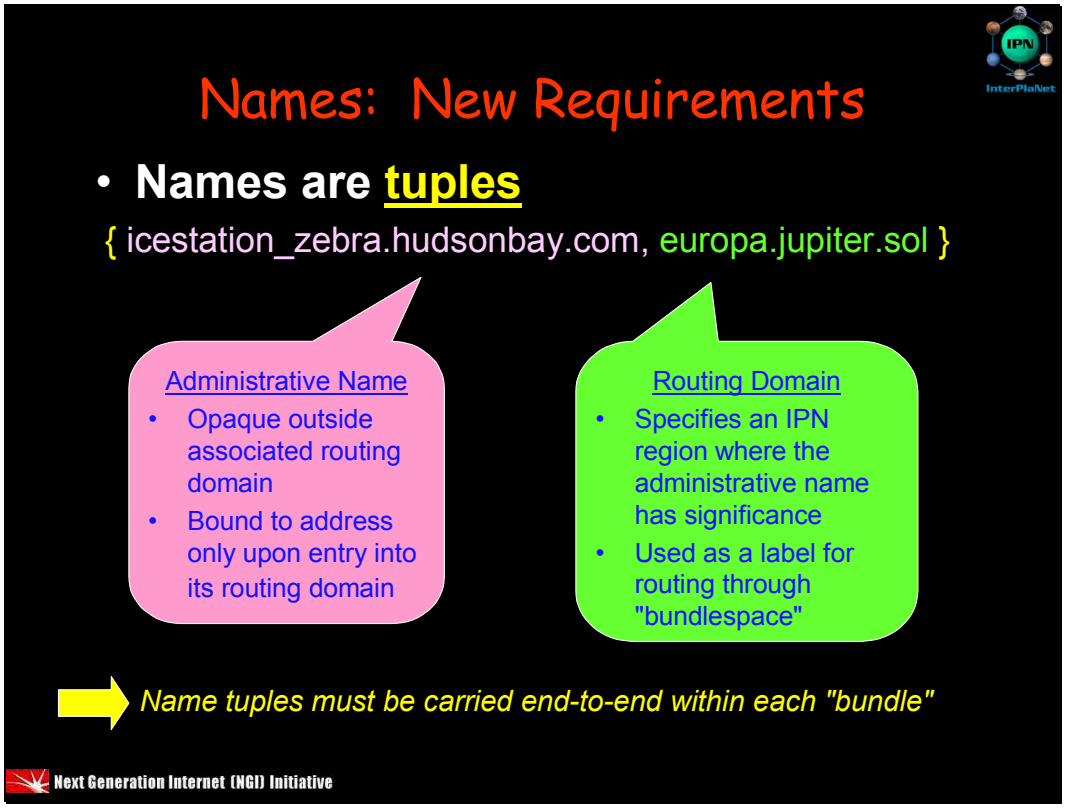

IPN
InterPlaNet
The Interplanetary Internet:
Status Report
CCSDS Management Council
Boulder, Colorado
29 November 2000
IPN Team:
Scott Burleigh, Vint Cerf,
Bob Durst, Adrian Hooke,
Keith Scott, Eric Travis, Howard Weiss
Next Generation Internet (NGI) Initiative

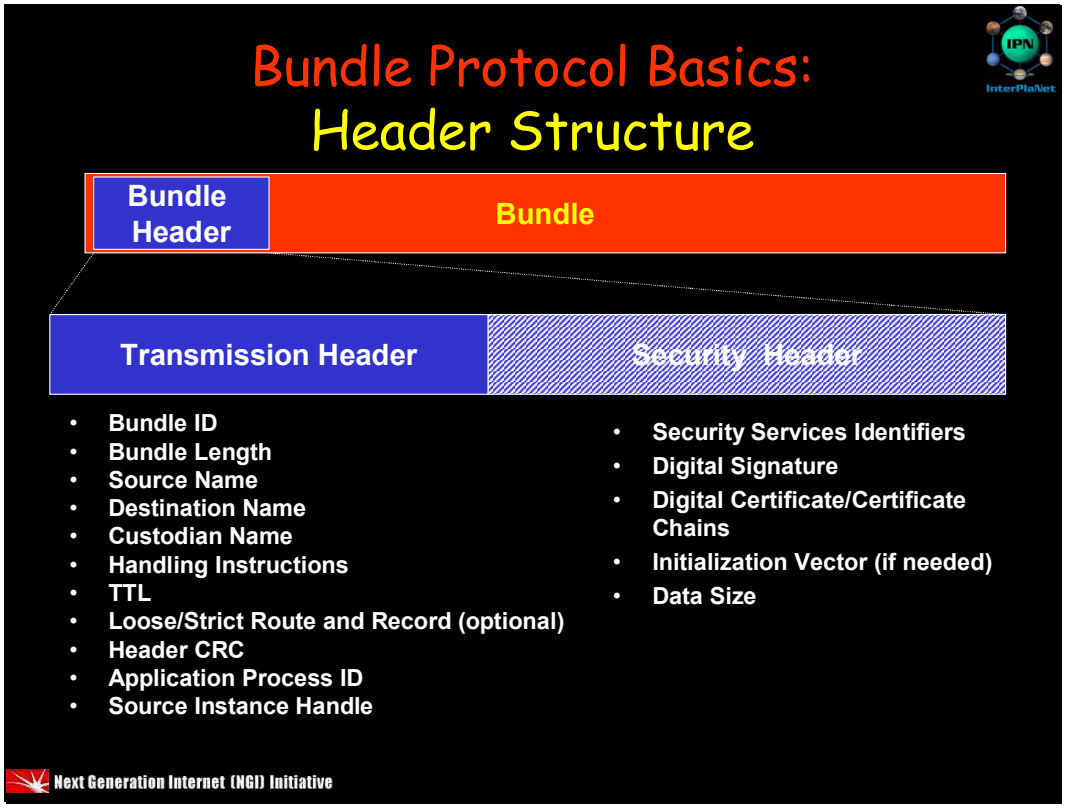

IPN
InterPlaNet
Operations driven by power, weight, volume
High value data, finite buffers
Transaction sizes are small compared to bandwidth-delay product
Long propagation delays
Backbone contact periods:
• short relative to delay
• possibly one-way
• possibly separated by days, weeks
• cannot guarantee an end-to-end path
Next Generation Internet (NGI) Initiative

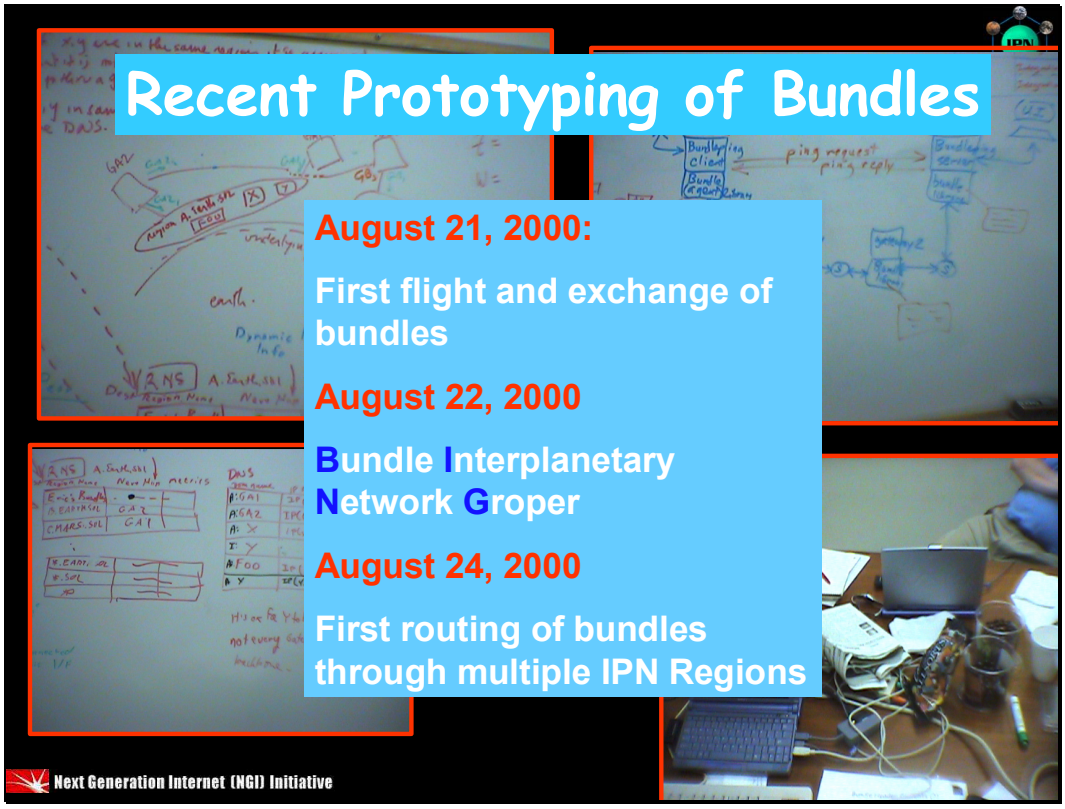

IP:
the "Thin Waist" of the Earth's Internet
App
App
App
App
App
App
Transport
TCP
Network
IP
Link. 1
Phys. 1
Network
IP
Link. 1
Link. 2
Phys. 1
Phys. 2
Network
IP
Link. 2
Link. 3
Phys. 2
Phys. 3
Transport
TCP
Network
IP
Link. 1
Phys. 1
Internet: a Network of Connected Sub-Networks
Next Generation Internet (NGI) Initiative


Bundles:
A Store and Forward Overlay -
the "Thin Waist" of the Interplanetary Internet
Bundling supports end-to-end transfer across an
intermittently connected "Network of Internets"
Application
Bundle
Transport
Network
Bundle
Transport
Network
Bundle
Transport
Network
Application
Bundle
Transport
Network
Network of Internets spanning dissimilar environments
Next Generation Internet (NGI) Initiative


Bundling Spans Temporal Discontinuities Between Networks
IPN
InterPlaNet
1
2
3
4
B
"Persistence of Vision" Provides End-to-End Connectivity
Next Generation Internet (NGI) Initiative


Names: New Requirements
IPN
InterPlaNet
• Names are tuples
{ icestation_zebra.hudsonbay.com, europa.jupiter.sol }
Administrative Name
• Opaque outside associated routing domain
• Bound to address only upon entry into its routing domain
Routing Domain
• Specifies an IPN region where the administrative name has significance
• Used as a label for routing through "bundlespace"
Name tuples must be carried end-to-end within each "bundle"
Next Generation Internet (NGI) Initiative


Bundle Protocol Basics:
Header Structure
InterPlaNet
Bundle Header
Bundle
Transmission Header
Security Header
Bundle ID
Bundle Length
Source Name
Destination Name
Custodian Name
Handling Instructions
TTL
Loose/Strict Route and Record (optional)
Header CRC
Application Process ID
Source Instance Handle
Security Services Identifiers
Digital Signature
Digital Certificate/Certificate Chains
Initialization Vector (if needed)
Data Size
Next Generation Internet (NGI) Initiative


Recent Prototyping of Bundles
August 21, 2000:
First flight and exchange of bundles
August 22, 2000
Bundle Interplanetary Network Groper
August 24, 2000
First routing of bundles through multiple IPN Regions
Next Generation Internet (NGI) Initiative

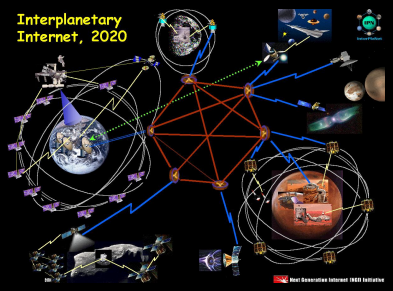
An Interplanetary Internet Scenario

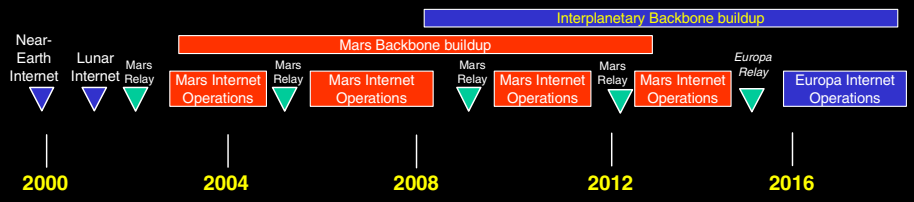
Expansion of the terrestrial Internet across the entire Solar System - an "interplanetary information superhighway"

Missions re-use emerging low-cost wireless Internet technologies in short-delay in-situ environments, connected via a high reliability long-haul backbone network.

Fully standardized network and protocols provide long-term stability and smooth evolution.

Fully automated integration of the terrestrial Internet with other distributed Internets in space allows public participation in exploration via Web-based telepresence





Next Generation Internet (NGI) Initiative

Desiderata for Interplanetary Internetworking

- Go thoughtfully in the knowledge that all interplanetary communication derives from the modulation of radiated energy, and sometimes a planet will be between the source and the destination. Therefore rely not on end-to-end connectivity at any time, for the universe does not work that way.
- Neither rely on ample bandwidth, for power is scarce out there and the bit error rates are high. Know too that signal strength drops off by the square of the distance, and there is a lot of distance.
- Consider the preciousness of interplanetary communication links, and restrict access to them with all your heart. Protect also the confidentiality of application data or risk losing your customers.
- Remember always that launch mass costs money. Think not, then, that you may require all the universe to adopt at once the newest technologies. Be backward-compatible.
- Never confuse patience with inaction. By waiting for acknowledgement to one message before sending the next, you squander tracking pass time that will never come to you again in this life. Send as much as you can, as early as you can, and meanwhile confidently await responses for as long as they may take to find their way to you.
- Therefore be at peace with physics, and expect not to manage the network in closed control loops -- neither in the limiting of congestion nor in the negotiation of connection parameters nor even in on-demand access to transmission bands. Each node must make its own operating choices in its own understanding, for all the others are too far away to ask. Truly the solar system is a large place and each one of us is on his or her own. Deal with it.

Scott Burleigh, 27 September 2000

Next Generation Internet (NGI) Initiative

Attachment O

Panel 1 Report

CCSDS PANEL 1 Boulder, November 28, 2000

P1 CHAIRMAN PROGRESS REPORT

TO THE CCSDS TSG/MC

November 2000, Boulder

BY

K.G.LENHART (ESA/ESOC)

CCSDS PANEL 1 Boulder, November 28, 2000

CONTENTS

CCSDS PANEL 1 Boulder, November 28, 2000

I. MEETINGS

PAST MEETINGS

A whole sequence of Sub-Panel meetings took place in Europe during October and November 2000 :
Meeting places were: Villafranca (Spain), Toulouse (France), Didcot (UK)

-- P1A, P1B, P1C,P1E, P1F, P1J, P1K

-- combined subpanel meetings P1A/P1B and P1B/P1E

-- workshop for CFDP interoperability tests

FUTURE MEETINGS

- Subpanel meetings will take place in spring 2001 (early May) in the US,
- Panel 1 Plenary at same location and time frame

- 2 -

CCSDS PANEL 1 Boulder, November 28, 2000

II.Σ REORGANISATION OF PANEL STRUCTURE

The Panel had been reorganised into seven subpanels:

1 A:	**Link Layer,**	**chairman:**	**Greg Kazz**
1 B:	**Coding Layer,**	**chairman:**	**Gian Paolo Calzolari**
1 C:	**Compression,**	**chairwoman:**	**Pen-Shu Yeh**
1 E:	**RF&Modulation,**	**chairman:**	**Jean Luc Gerner**
1 F:	**Higher Layers,**	**chairman:**	**Adrian Hooke**
1 J:	**Navigation,**	**chairman:**	**Felipe Flores-Amaya**
1 K:	**On-board Interfaces/, (SOIF)**	**chairman:**	**Damien Maeusli**

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CCSDS PANEL 1 Boulder, November 28, 2000

III. STATE OF ACTIVITIES

SUB-PANEL 1A

Separate report to be given by subpanel chairman

SUB-PANEL 1B

The subpanel worked on different efficient codes including turbocodes and held combined meetings with 1A and 1E
Resolutions on Coding from May are confirmed.
A more detailed report will follow

SUB-PANEL 1C

Separate report to be given by subpanel chairwoman

- 4 -

CCSDS PANEL 1 Boulder, November 28, 2000

SUB-PANEL 1E

The Sub-Panel worked on the following subjects:

- **Bandwidth-efficient modulation for Space Research**
- **8 PSK TCM for Earth Exploration, high data rates**
- **three resolutions were prepared for agency review as red recommendations**
  - **3.3.5A for Space Research cat A**
  - **3.3.5B Space Research cat B**
  - **3.3.6 for Earth Exploration**

SUB-PANELS 1A/1E

The two Sub-Panels worked in a combined meeting at the following subjects:

- **Trellis-Coded Modulation**
- **Proximity Link**

- 5 -

CCSDS PANEL 1 Boulder, November 28, 2000

- 6 -

CCSDS PANEL 1 Boulder, November 28, 2000

SUB-PANEL 1F
separate report by subpanel chairman

The Sub-Panel worked on the following subjects:

- **CFDP**
- **ptototype SW interoperability testing**
- **proposal for testing with life Spacecraft (STRV 1D)**

SUB-PANEL 1J
separate report by subpanel chairman

- 7 -

CCSDS PANEL 1 Boulder, November 28, 2000

SUB-PANEL 1K, (SOIF), separate report by Mr P. Shames

The Sub-Panel worked on the following subjects:

- **SOIF reference model for on-board data handling**
- **on-board data busses**
- **onboard network management etc..**
- **SOIF requirements**

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CCSDS PANEL 1 Boulder, November 28, 2000

IV. RESOLUTIONS

Subpanel 1A (link layer)

Panel 1 has completed work to revise a number of CCSDS Recommendations to permit handling NP, IP and Encapsulation Packets.
The first 5 resolutions below initiate the process of releasing these changes. In these cases and for recommendation 6, a six-week agency review period is suggested.
In resolution 7, a streamlined agency review of the restructured Recommendations would be advisable (shorter time period).

1. Panel 1 resolves to request the Management Council to release
Packet Telemetry, Pink Sheets, CCSDS 102.0-P-4.1 as a Blue Book, contingent on completion of agency approvals.

2. Panel 1 resolves to request the Management Council to release
Packet Telemetry Services Pink Sheets, CCSDS 103.0-P-1.1 for agency review.

3. Panel 1 resolves to request the Management Council to release
Telecommand, Part 2 Pink Sheets, CCSDS 202.0-P-2.1 for agency review.

4. Panel 1 resolves to request the Management Council to release
Telecommand, Part 3 Pink Sheets, CCSDS 203.0-P-1.1 for agency review.

5. Panel 1 resolves to request the Management Council to release
Advanced Orbiting Systems Networks and Data Links, Pink Sheets,

- 9 -

CCSDS PANEL 1 Boulder, November 28, 2000

CCSDS 701.0-P-2.1 for agency review.

6. Panel 1 resolves to request the Management Council to release
Space Link Identifiers, White Book, SLI-DW-3 as a Red Book for agency review.

7. Panel 1 resolves to request the Management Council to encourage member agencies to streamline the review of the restructured CCSDS draft red books.

TM Space Data Link Protocol, CCSDS 132.0-R-1;
Space Packet Protocol, CCSDS 133.0-R-1;
TC Space Data Link Protocol, CCSDS 232.0-R-1;
Communications Operation Procedure-1, CCSDS 232.1-R-1;
AOS Space Data Link Protocol, CCSDS 732.0-R-1;
Channel Coding and Synchronization-Part 1: Synchronous, **CCSDS 131.0-R-1**; **Channel Coding and Synchronization-Part 2: Asynchronous**, **CCSDS 231.0-R-1**

as soon as each document becomes available after Panel 1A review.

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CCSDS PANEL 1 Boulder, November 28, 2000

Note: for last MC meeting the following was suggested as well (status not known):
A special preface on each book and a special CCSDS web page is suggested, with prominent explanation that in the future (but not now) these will eventually replace the current recommendations after a relatively long review period (>6 months).

- 11 -

CCSDS PANEL 1 Boulder, November 28, 2000

IV. RESOLUTIONS
(Continued)

Related to Sub-Panel 1E

The following three recommendations should be released for Agency Red Book review

- Rec. 3.3.5A **MODULATION METHODS AT HIGH SYMBOL RATES TRANSMISSIONS, SPACE RESEARCH, SPACE-TO-EARTH, CATEGORY A**
- Rec. 3.3.5B **MODULATION METHODS AT HIGH SYMBOL RATES TRANSMISSIONS, SPACE RESEARCH, SPACE-TO-EARTH, CATEGORY B**
- Rec. 3.3.6 **MODULATION METHODS AT HIGH SYMBOL RATES TRANSMISSIONS, Earth Exploration Satellites (EES) 8 GHZ Band, SPACE-TO-EARTH**

For other subpanels resolutions are reported separately

- 12 -

CCSDS PANEL 1 Boulder, November 28, 2000

5. Considerations for TSG/MC

- For easier access to SW, the CCSDS website should have a separate place for SW download and storage (status not known)

- Tests with the STRV 1D spacecraft are planned as interoperability tests with several participating agencies, possibly some more agencies could join, even if it is only passive reception

- 13 -

CCSDS PANEL 1 Boulder, November 28, 2000

VI. ISSUES FOR MC

- Σ Frequency band congestion requires considerable effort (bandwidth efficient modulation)
- Σ New work for on-board interfaces gets much attention
- Σ General progress in spite of budget limitations high
- Σ Replanning and priority setting may be useful in line with an update to the CSP
- Σ High level of activity in 7 subpanels necessitates extended meetings, (not easy to organise)
- Σ Reorganisation of Panel took place and showed positive results

- 14 -

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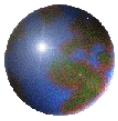
Attachment P

Panel 2 Report

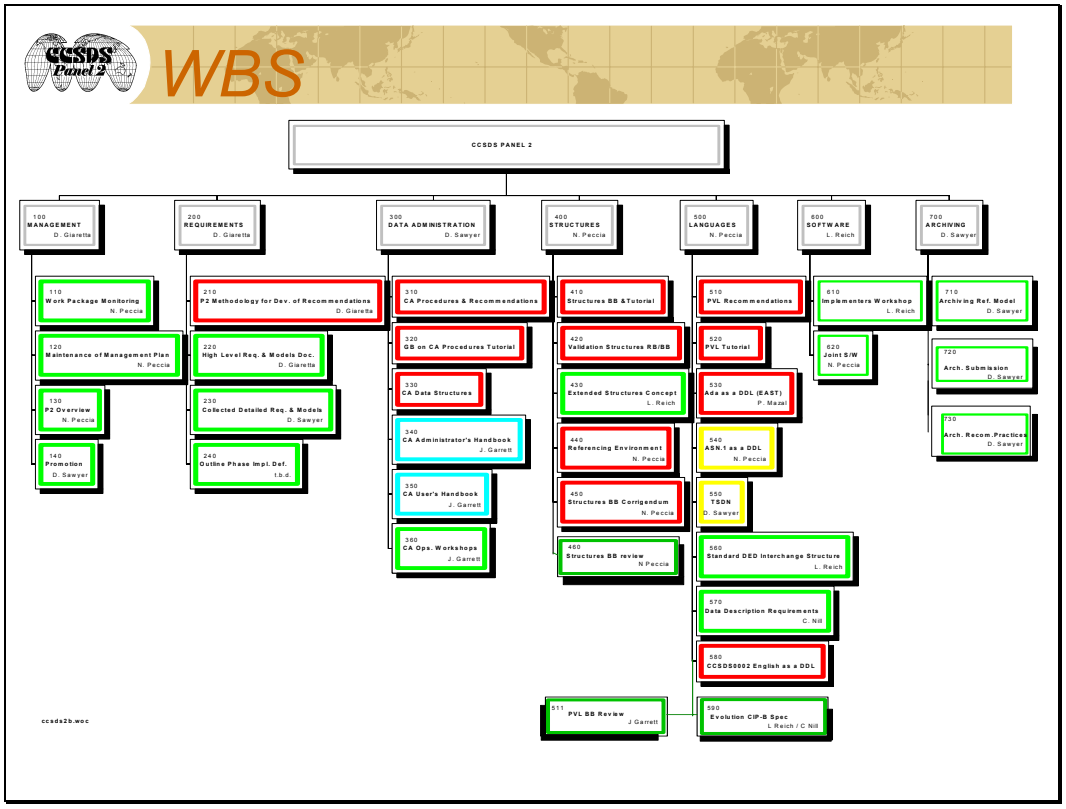


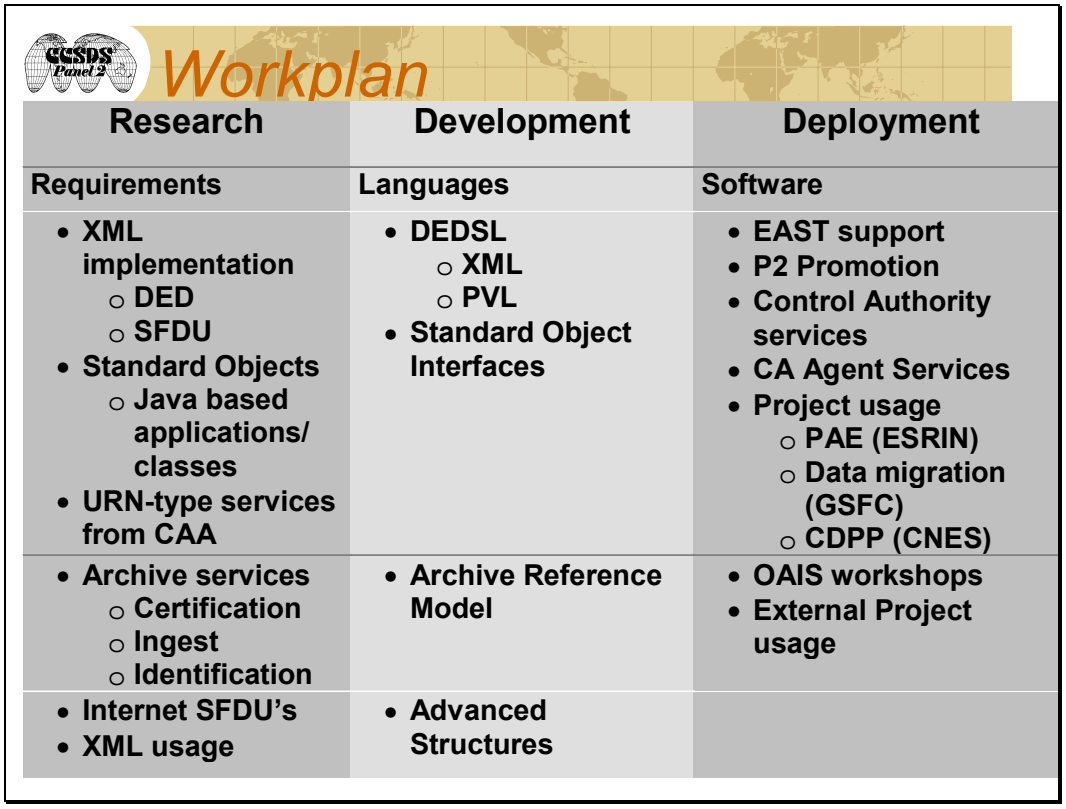
Panel 2 Report to TSG/MC Nov 2000

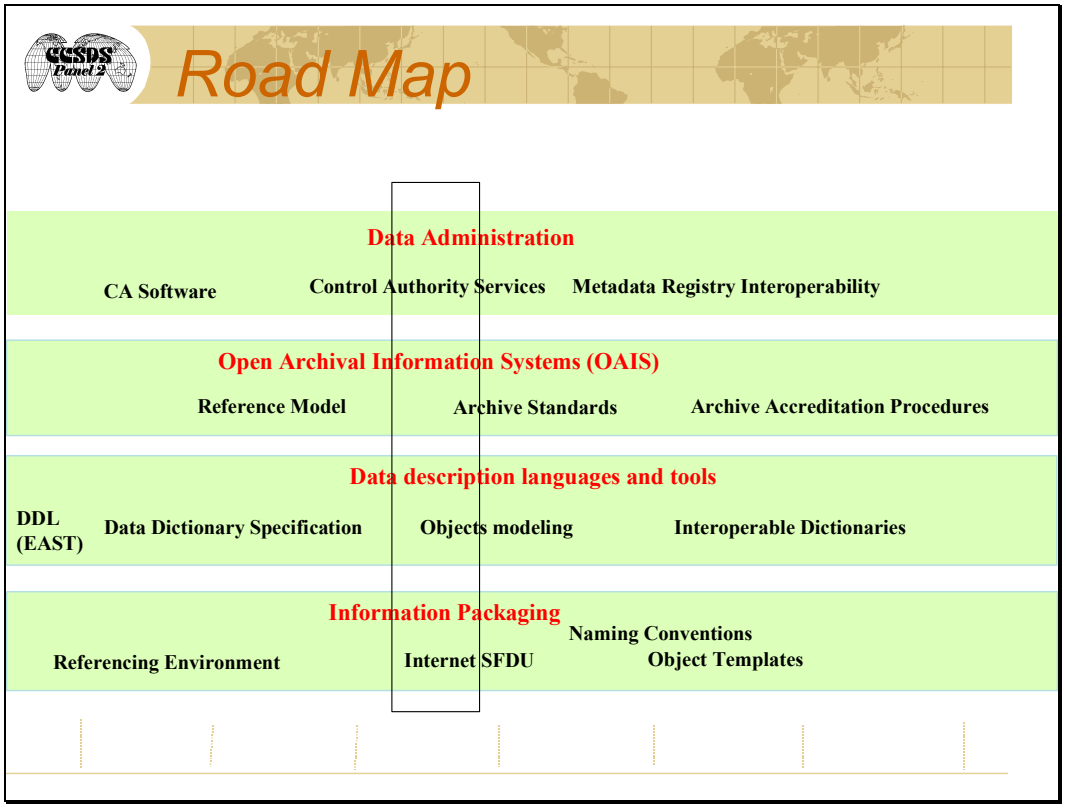
D Giaretta

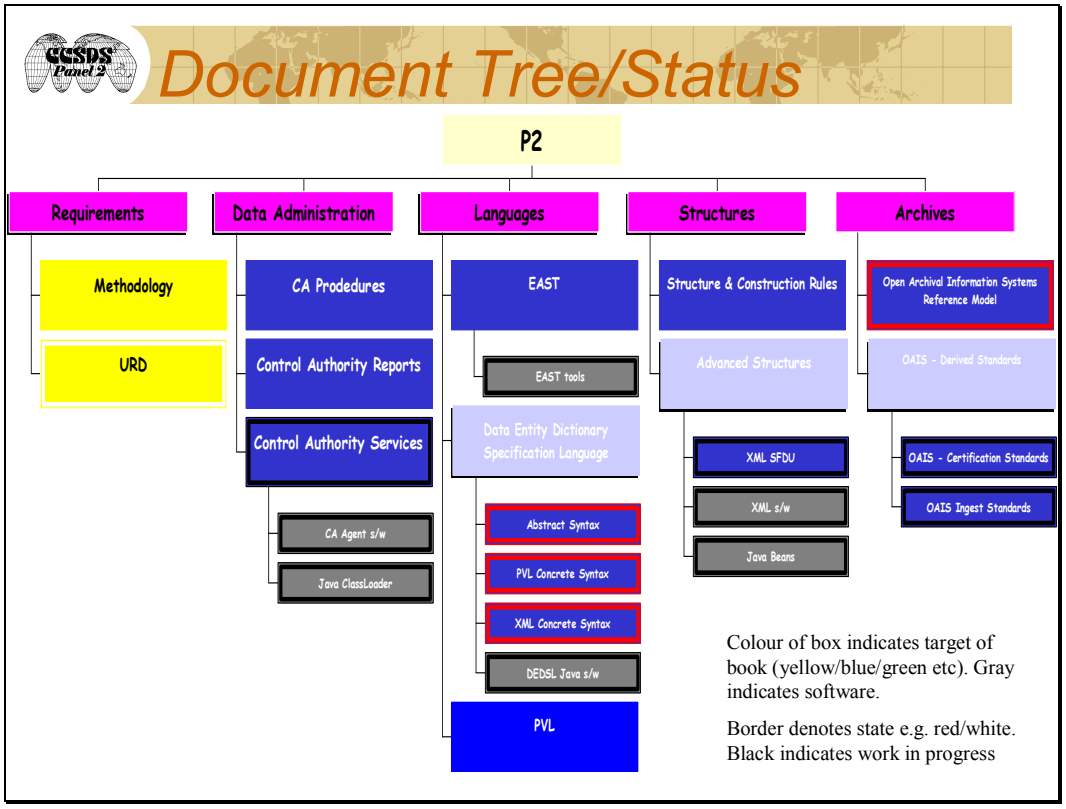
Report Structure

- Status of activities
  - WBS
  - Workplan
  - Document Tree/ Status
  - Organisation
- Work Progress
  - Actual production of documents
  - Accomplishments
  - Meetings
- Resolutions
- Conclusions/Issues

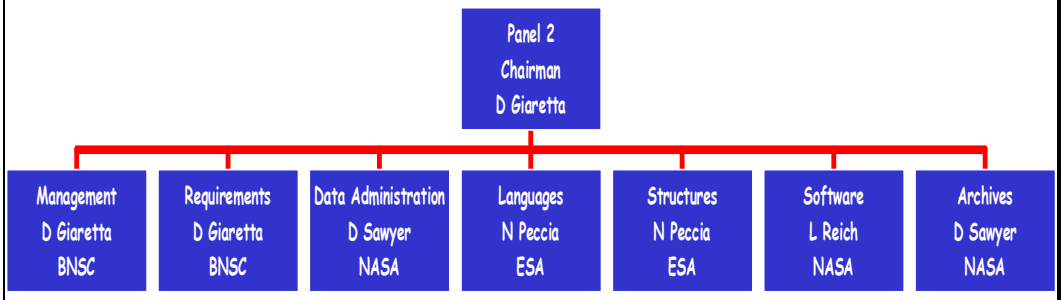

WBS
CCSDS PANEL 2
100 MANAGEMENT D. Giaretta
200 REQUIREMENTS D. Giaretta
300 DATA ADMINISTRATION D. Sawyer
400 STRUCTURES N. Peccia
500 LANGUAGES N. Peccia
600 SOFTWARE L. Reich
700 ARCHIVING D. Sawyer
110 Work Package Monitoring N. Peccia
120 Maintenance of Management Plan N. Peccia
130 P2 Overview N. Peccia
140 Promotion D. Sawyer
210 P2 Methodology for Dev. of Recommendations D. Giaretta
220 High Level Req. & Models Doc. D. Giaretta
230 Collected Detailed Req. & Models D. Sawyer
240 Outline Phase Impl. Def. t.b.d.
310 CA Procedures & Recommendations
320 GB on CA Procedures Tutorial
330 CA Data Structures
340 CA Administrator's Handbook J. Garrett
350 CA User's Handbook J. Garrett
360 CA Ops. Workshops J. Garrett
410 Structures BB & Tutorial
420 Validation Structures RB/BB
430 Extended Structures Concept L. Reich
440 Referencing Environment N. Peccia
450 Structures BB Corrigendum N. Peccia
460 Structures BB review N Peccia
510 PVL Recommendations
520 PVL Tutorial
530 Ada as a DDL (EAST) P. Mazal
540 ASN.1 as a DDL N. Peccia
550 TSDN D. Sawyer
560 Standard DED Interchange Structure L. Reich
570 Data Description Requirements C. Nill
580 CCSDS0002 English as a DDL
590 Evolution CIP-B Spec L Reich / C Nill
511 PVL BB Review J Garrett
610 Implementers Workshop L. Reich
620 Joint S/W N. Peccia
710 Archiving Ref. Model D. Sawyer
720 Arch. Submission D. Sawyer
730 Arch. Recom. Practices D. Sawyer
ccsds2b.woc


Workplan
Research
Development
Deployment
Requirements
Languages
Software
• XML implementation
○ DED
○ SFDU
• Standard Objects
○ Java based applications/ classes
• URN-type services from CAA
• DEDSL
○ XML
○ PVL
• Standard Object Interfaces
• EAST support
• P2 Promotion
• Control Authority services
• CA Agent Services
• Project usage
○ PAE (ESRIN)
○ Data migration (GSFC)
○ CDPP (CNES)
• Archive services
○ Certification
○ Ingest
○ Identification
• Archive Reference Model
• OAIS workshops
• External Project usage
• Internet SFDU's
• XML usage
• Advanced Structures


Road Map
Data Administration
CA Software
Control Authority Services
Metadata Registry Interoperability
Open Archival Information Systems (OAIS)
Reference Model
Archive Standards
Archive Accreditation Procedures
Data description languages and tools
DDL (EAST)
Data Dictionary Specification
Objects modeling
Interoperable Dictionaries
Information Packaging
Referencing Environment
Internet SFDU
Naming Conventions
Object Templates


Document Tree/Status
P2
Requirements
Data Administration
Languages
Structures
Archives
Methodology
URD
CA Prodedures
Control Authority Reports
Control Authority Services
CA Agent s/w
Java ClassLoader
EAST
EAST tools
Data Entity Dictionary Specification Language
Abstract Syntax
PVL Concrete Syntax
XML Concrete Syntax
DEDSL Java s/w
PVL
Structure & Construction Rules
Advanced Structures
XML SFDU
XML s/w
Java Beans
Open Archival Information Systems Reference Model
OAIS - Derived Standards
OAIS - Certification Standards
OAIS Ingest Standards
Colour of box indicates target of book (yellow/blue/green etc). Gray indicates software.
Border denotes state e.g. red/white. Black indicates work in progress

Organisation



Actual production of books-1

Data Entity Dictionary Specification Language (DEDSL)

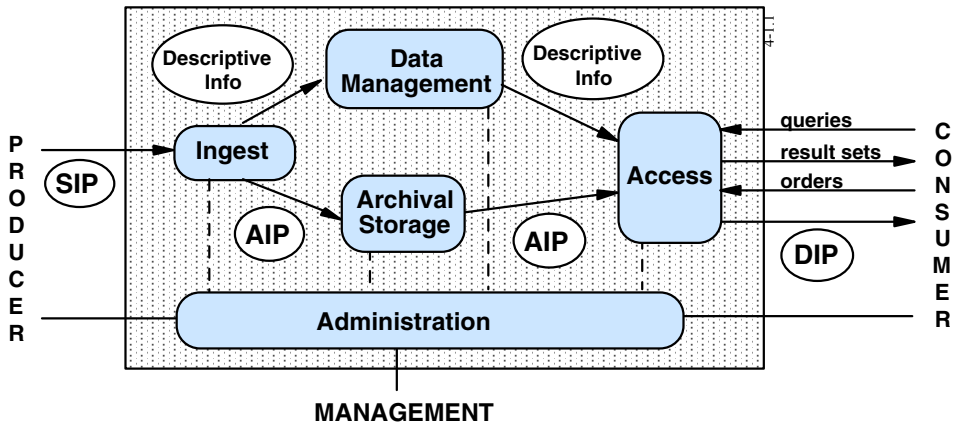
- DEDSL Abstract Syntax - Red Book review ends mid-December
- DEDSL PVL Syntax – Red Book review ends mid-December
- DEDSL XML Syntax - to CCSDS editor as Red Book prior to MC meeting
  - Not recommending a parallel review in ISO
  - Will also contact W3C to put document on W3C/XML pages as a note

Actual production of books-2

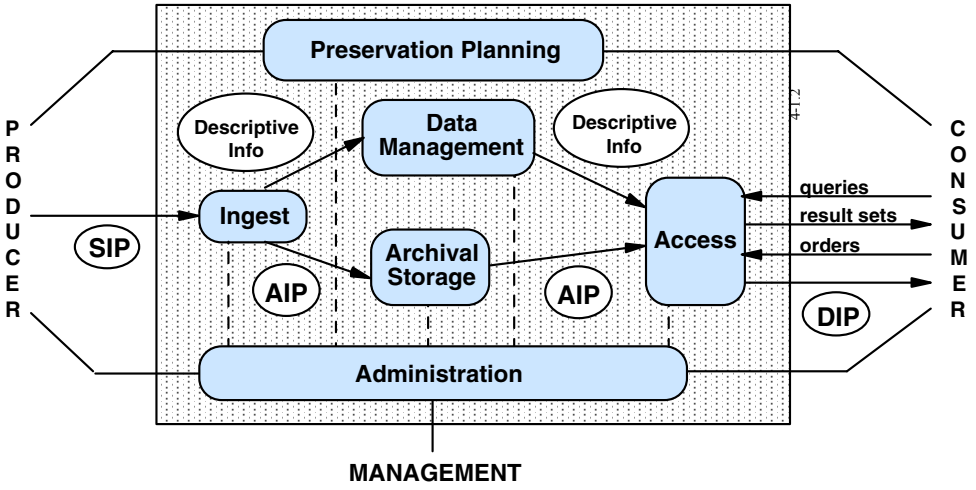
OAIS Ref. Model

- ISO DIS review and Agency Red Book review in progress
  - Ends November 15th
  - RIDS (to Oct 2000) addressed already
    - Changes required to clarify "PRESERVATION PLANNING" function - show as separate entity in Functional Model - mostly just reorganisation of material
- Plan to have a new Red Book/ISO 2 month review starting April 2001.
- Assuming only minimal delays this should produce an FDIS in Sept 2001

Current OAIS Functional Model



Revised OAIS Functional Model



Actual production of books-3

- EAST extension – pink pages –review completed
- PVL Extension – now Blue Book
- PVL Tutorial - Green Book – going to CCSDS editor
- Unique Identification – Yellow Book awaiting publication

New/Ongoing Work

- OAIS
  - INGEST standards
  - Mission Archives
  - Access/ Software Preservation
  - Certification/Best Practice
- Structures
  - XML/JAVA based packaging
  - Standard Objects
- Languages
  - DEDSL tutorial
  - DEDSL-XML/Schema

Accomplishments

- OAIS
  - OAIS Reference Model very successful
    - Being used by many projects (Nedlib, CEDARS, Inter-PARES, CDPP, SIPAD, NSSDC, British Library, Royal Library of the Netherlands (RLN), San Diego Supercomputer Centre…)
    - Being mandated in some Proposal documents (ITT/RFP)
    - IBM implementing OAIS-based system for RLN (£5M project)
  - France setting up a working group within ARISTOTE (http://www.aristote.asso.fr) – interested in archive digital information, including libraries and Dept of Justice.
    - "astonishing unifying role"
  - OAIS likely to be used by International Council for Scientific Unions (ICSU) as basis for study on long-term preservation

Accomplishments-2

- Software
  - CDPP (CNES)
  - EAST tools being made freely available – for many operating systems (http://logiciels.cnes.fr)
  - Prototypes for XML tools being developed for DEDSL, Packaging etc

Accomplishments-3

- Presentations
  - IAF presentation
- Research
  - Formats Evolution Process

XML use in end-to-end system

- SML review action showed strong overlap with P3 and P2 domains
  - P2 overlap NOT developed in the SML current document
  - Emphasised end-to-end approach
- P2 has been developing DEDSL in XML and "Internet packaging" (Internet-SFDU)
- P2 proposes TSG organise a 1-day workshop on use of XML in an end-to-end system as part of the May 2001 TSG meeting. Invitees:
  - CSOC/SOMO
  - ICS (SML developers)
  - XSIL developers
  - etc

Meetings held/planned

- Bi-Monthly telecons normally held
- Fall 2000 meeting: RAL (UK)
  - 30 Oct - Nov 8
- Spring 2001: AMES (USA)
  - 14-22 May

Proposed Resolutions

- Publish DEDSL – XML/DTD as Red Book
  - Will also contact W3C to put document on W3C/XML pages as a note
- email ballot to publish DEDSL Abstract Syntax and DEDSL PVL Syntax as Blue Books (March 2001)
- Publish new version of EAST Blue Book incorporating Pink Pages
- e-mail ballot to be held for publication of OAIS 2nd Red Book and ISO review, when ready (March 2001), length of review 2 months
- Publish PVL Green Book

The GRID

- Many National and international efforts
- Will encourage distributed, multidisciplinary science and use of archives
- Standards are essential
- Opportunity for P2
  - If we can produce the docs fast
  - Otherwise we could adopt de-facto standards

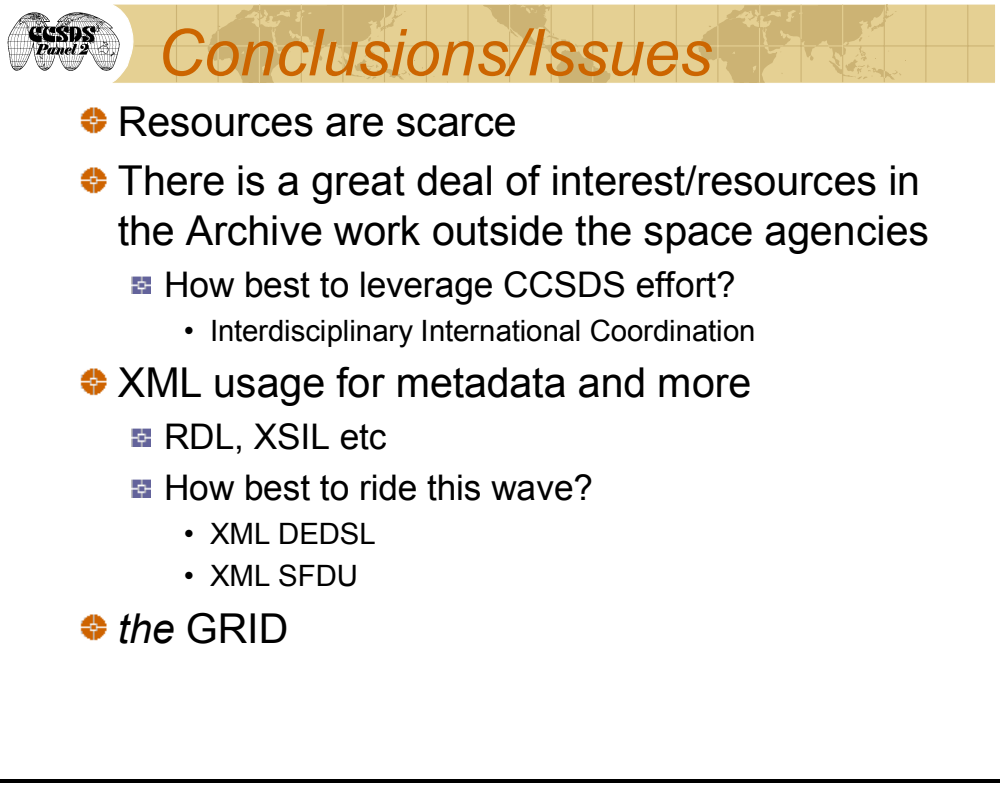
InterPanel work

- CFDP (File metadata)
- P1J (Navigation formats)
- SOIF (use of EAST to describe telemetry etc)
- Security WG (archives access etc)
- XML end-to-end

Concerns

OMG Activity

- Ensure P2 work is considered
  - E.g. use of DEDSL to supplement IDL
- Ensure panel members are provided with all relevant CCSDS-OMG plans
  - E.g., Orlando planning not visible to P2


Conclusions/Issues
Resources are scarce
There is a great deal of interest/resources in the Archive work outside the space agencies
How best to leverage CCSDS effort?
Interdisciplinary International Coordination
XML usage for metadata and more
RDL, XSIL etc
How best to ride this wave?
XML DEDSL
XML SFDU
the GRID

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Attachment Q

Panel 3 Report

Panel 3 Presentation

PROGRESS REPORT TO

Technical Steering Group
&
Management Council

Maurice Winterholer
P3 CHAIRMAN

Report to TSG / MC - BOULDER - Fall 2000

PANEL 3

Presentation Outline

- 1. General Status of Activities
  - 1.1 Objectives / Organization
  - 1.2 Documentation structure
  - 1.3 Documentation Status
  - 1.4 Work Breakdown Structure
  - 1.5 Work Packages Status
- 2. Work Progress since TOULOUSE (Workshop #24 - June 00)
  - 2.1 Documentation production
  - 2.2 Past and planned Meetings
- 3. Particular points
  - 3.1 SLE Transfer Services
  - 3.2 SLE management
- 4. Conclusions

CENTRE NATIONAL D'ETUDES SPATIALES

PANEL 3 General Status of Activities

1.1 Objectives & organization (1/2)

1. MAJOR OBJECTIVES MAINTAINED

- No New Work Item
- EMPHASIS on the development of recommendation for :
  - mapping rules for the implementation of SLE services over existing Telecommunication systems (TCP/IP, CORBA…)
  - SLE Service Management RED BOOK issue 2 foreseen for December 2000
  - SLE transfer Services recommendation RED 2 :
    - CLTU R-2 (may 2000) reviewed
    - RAF sent to CCSDS secretariat for R-2 publication
    - RCF almost ready to be sent to the secretariat for R-2 publication (consistency with RAF is performed)
    - FSP almost ready to be sent to the secretariat for R-2 publication (internal ESA review)
    - FTCF ready to be sent to the secretariat for R-2 publication (waiting for RAF, CLTU and FSP)

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PANEL 3 General Status of Activities

1.1 Objectives & organization (2/2)

2. **No Modification of the ORGANISATION :**

☞**Presently 3 Working Groups WG1, WG2/3, WG5**

- **WG1 : SLE management service, SLE concept & Reference documents**
- **WG2/3 : SLE transfer services specifications**
- **WG5 : SLE Transfer services API & Security**

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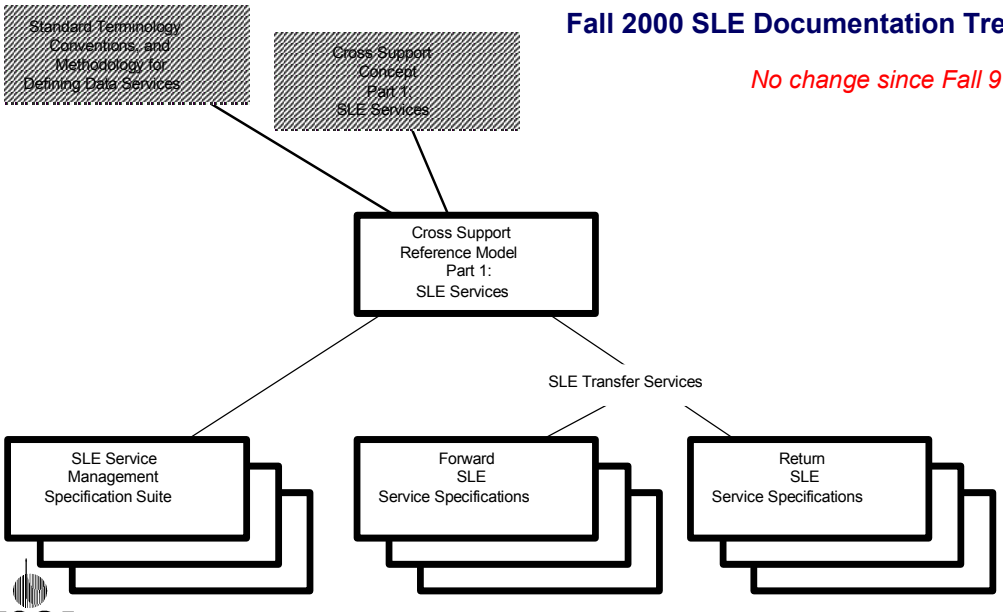
Report to TSG/ MC - BOULDER - Fall 2000 - M. *Winterholer* 4/17

PANEL 3 General Status of Activities

1.2 Documentation structure

Fall 2000 SLE Documentation Tree

No change since Fall 98



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PANEL 3 General Status of Activities

1.3 Documentation Status (1/2)

The SLE documentation is in the following status **before Orlando WS 25 :**

SLE Service Management (910.5-R-1) February 2000 -
-> New Red-2 version agreement foreseen at Orlando meeting

Return All Frames (911.1-R-2) recently sent to secretariat (November 2000)
Return Channel Frames RCF (911.2-R-1.7) September 1999 -
-> Red-2 version in preparation for December 2000 (consistency with RAF)
Return OCF (911.4-Draft Red-1) October 1998
Return FSH (911.5-Draft Red-1) October 1998
Return Space Packet (911.7-W-1) August 1998
} New versions embedded in future "return combined book" which will be issued after RAF and RCF blue books

Consolidated Return Services Specification (911-D-2) June 2000 -
-> under P3 internal review

PANEL 3 General Status of Activities

1.3 Documentation Status (2/2)

The SLE documentation is in the following status **before Orlando WS 25 (con't) :**

Forward CLTU Service (912.1-R-2) New R-2 issue in September 2000 -
-> Reviewed by the Agencies

Forward Telecommand Frame (912.2-R-1 - 2nd Draft Red-1) October 1999-
-> Issue ready to be publish as red (waiting for CLTU, RAF and FSP)

Forward Space Packet (912.3-R-1.9.2) July 1999 -
-> red-2 issue under ESA internal review before R-2 publication

Forward TC VCA (912.4-W-2) July 1998
} New versions embedded in future "forward combined book" which will be issued after CLTU, FSP and FTCF blue books

PANEL 3 General Status of Activities

1.4 Work Breakdown Structure (1/3)

The Work plan was revised and updated at the P3 Workshop 24, in Toulouse ,FR , June 13-16 2000 .

No major Changes

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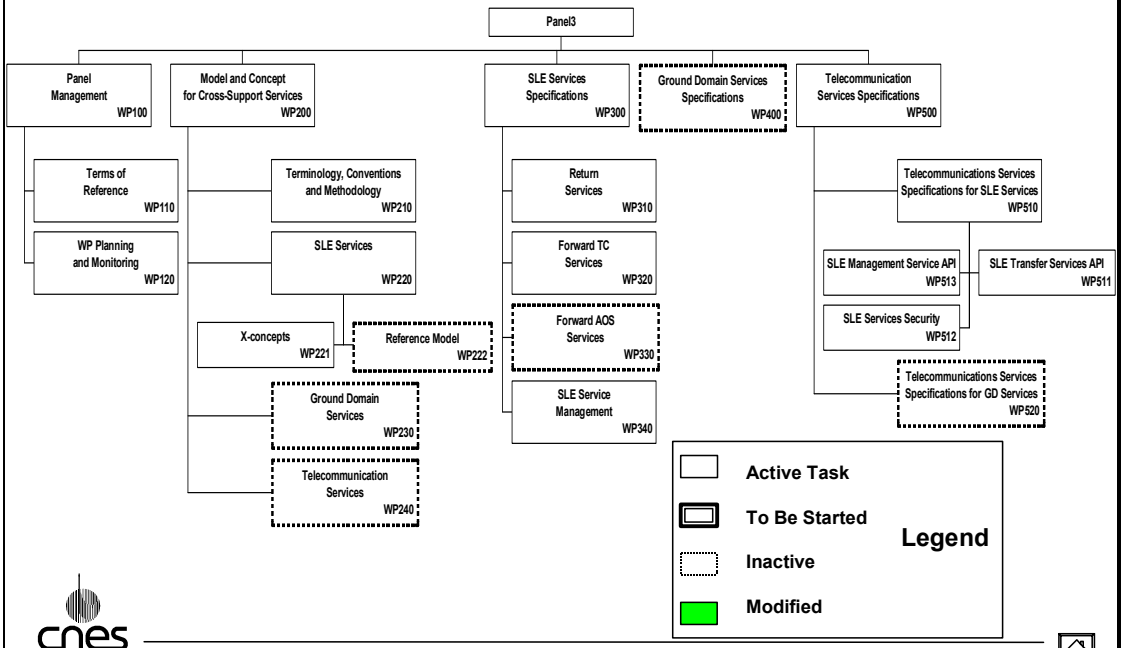
PANEL 3 General Status of Activities

1.4 Work Breakdown Structure (2/3)



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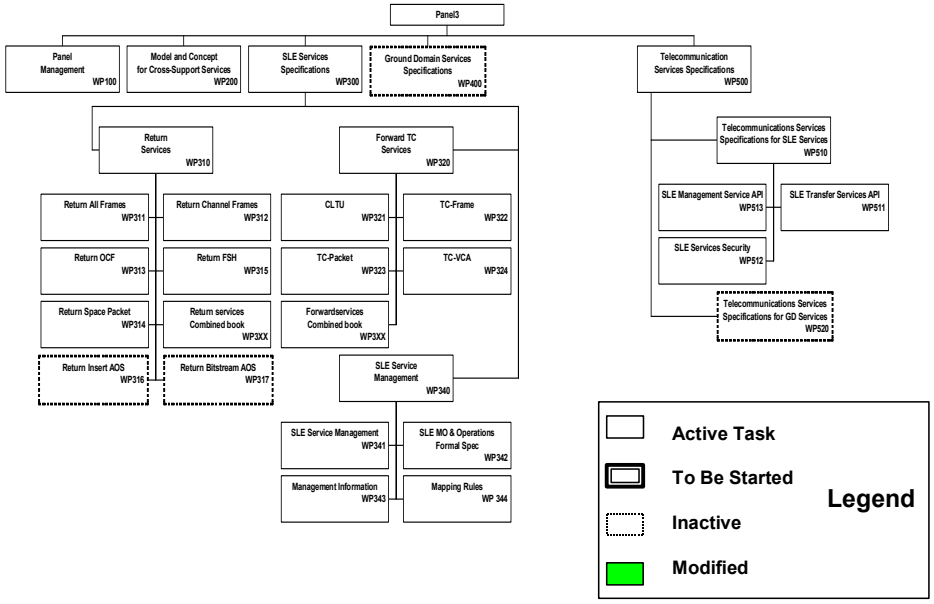
PANEL 3 General Status of Activities

1.4 Work Breakdown Structure (3/3)



PANEL 3 General Status of Activities

1.5 Fall 2000 Work Packages Status

WP ID	PACKAGE TITLE	STATUS
WP 110	Terms of reference	*closed / YB*
WP 120	WP Planning and monitoring	active
WP 210	TCM	*closed / GB*
WP 221	Cross Support Concept	*active / GB*
WP 222	SLE-Reference Model	*inactive / BB*
WP 311	RAF Service Specification	active
WP 312	Return Frames (VC& MC)	active
WP 313	Return OCF (MC & VC)	active
WP 314	Return Space Packet	active
WP 315	Return FSH (MC& VC)	active
WP 3xx	Consolidated Return Services	active
WP 321	CLTU Service Specification	active
WP 322	Forward TC Frame Specification	active
WP 323	Forward Space Packet	active
WP 324	Forward TC-VCA	active
WP 3xx	Consolidated Forward Services	active
WP 341	SLE SM Specification	active
WP 342	SLE MO and Operations formal Specification	active
WP 343	Management information	active
WP 344	Mapping rules (GDMO & IDL)	active
WP 511	SLE application programming interface	active
WP 512	SLE security framework	active
WP 513	SLE Service Management API	active

active : WP under process - closed : WP achieved GB/BB/YB - waiting : WP not started

PANEL 3 Work Progress since TOULOUSE

2.1 Documentation Production (1/2)

BOOKS ISSUING

- Global documentation tree maintained (small internal change)
- Service Management RED 910.5-R-2 foreseen in Dec 2000 (WS#25)
  - R1 book Agency Review ended in July 2000
  - About 400 RIDs transmitted
  - Internal WG1 activities to take into account these comments
  - Formal RIDs answers during next WS in Orlando
  - Discussion still open on the splitting of the companion documents
- Service Management materials are in progress
  - GDMO specifications of Managed Objects (Dec. 2000)
  - IDL-OMG interface spec. document will be added (CNES - Dec. 2000)
  - GDMO mapping rules (XML, JAVA, CIM, …) draft (ESA - Dec. 2000)
  - IDL mapping rules (CORBA, RMI, DCOM, SOAP, …) (NASA, CNES …)
- Transfer Service production
  - CLTU red-2 reviewed by Agencies
  - RAF submitted to CCSDS secretariat for red-2 publication
  - FTCF ready to be submitted as red-1 ("RED book quality")
  - RCF and FSP almost ready to be submitted as red-2
  - Return Services Draft 2 internally distributed for P3 comments

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Report to TSG/ MC - BOULDER - Fall 2000 - M. *Winterholer* 12/17

PANEL 3 Work Progress since TOULOUSE

2.1 Documentation Production (2/2)

SCHEDULE CHANGES

	Current	2000		2001		2002	
TCM	Green						
CS Concept	Green		Green				
CS Ref Mod	Blue						
SLE Service Mgmt	Red-1		**Red-2**	Blue			
SM MO & O	White	White	Red	Blue			
Data Channel Tree	White	White	Red				
Auth & Access Ctrl	White	White	Red				
SM Imp. Rules		White	Red				
SLE RAF	Red-1	~~Red-2~~	**Red-2**	**Blue**			
SLE RCF	Red-1	~~Red-2~~	**Red-2**	**Blue**			
SLE FSP	Red-1	~~Red-2~~	**Red-2**	**Blue**			
SLE FTCF	White			**Red-2**	**Blue**		
SLE CLTU	Red-1	~~Red-2~~	**Red-2**	**Blue**			
SLE ROCF	White			In consolidated return book			
SLE RFSH	White			In consolidated return book			
SLE RSP	White			In consolidated return book			
SLE TCVCA	White			In consolidated forward book			
Combined Return	Draft	~~White~~	~~Red~~	**White**	**Red**	**Blue**	
Combined Forward		~~White~~		**White**	**Red**	**Blue**	
SLE Appl API		White-2	Red	Blue			
SLE User Auth.		Draft	White-1	White-2	Red		
SLE Realization		White	White-2	Green			

CENTRE NATIONAL D'ETUDES SPATIALES

Report to TSG/ MC - BOULDER - Fall 2000 - M. *Winterholer* 13/17

PANEL 3 Work Progress since TOULOUSE

2.2 Past & Planned Meetings

PAST MEETINGS

Workshop	17	November 4-8, 96	OBERPFAFFENHOFEN
	18	May 19-23, 97	SILVER SPRING
	19	November 3-7, 97	VILLAFRANCA
	20	May 4-8, 98	HOUSTON
	21	Oct 26-30, 98	DARMSTADT
	22	May 07-12, 99	NEWPORT
	23	Oct 11-15, 99	DARMSTADT
	24	June 13-16, 2000	TOULOUSE

2 intermediate meetings for WG1

September, 2000	LONDON (VEGA)
October, 2000	GREENBELT (GST)

No intermediate meeting for other WG's (2/3 and 5)

FUTURE MEETINGS

- *Next P3 Workshop "25" : December 11-15, 2000 in ORLANDO - USA*
- *Joint meeting with the Object Management Group (OMG) is tentatively scheduled during P3 #25 workshop (December 2000)*

PANEL 3 Particular points

3.1 SLE transfer services

☞ Recommendations for data transfer protocols/services well adapted for the secure transport of CCSDS Space link data units between the operation ground systems of the agencies

☞ Favorable encouragements from the agencies in the IOAG forum which invited the panel 3 to finalize the SLE transfer services blue books. The mature situation of the transfer services will allow to go quickly toward blue recommendations … if the agencies provide resources (in terms of technical experts in Panel 3)

☞ Possible suggestion from IOAG to transfer manpower between WG1 to WG2/3 is a dream (non realistic and non efficient)

PANEL 3 — Particular points

3.2 SLE management

Situation

☞ The work in the management area has provided high quality results and a red book

☞ The agencies in the IOAG forum requested the Panel 3 to postpone the SM work

Panel 3 position

☞ SLE Management services are essential to an effective cross support to standardize, automate and facilitate the cross support "management interface" (system configuration, transfer service requesting and information reporting) :

- The purpose is not to standardize the internal agencies management, nor to allow an external authority to control and monitor the internal facilities from another agency
- The purpose is to standardize the definition of the actions and the data at the interface between a provider agency and a user agency in the frame of a cross support situation.

☞ Panel 3 will address this issue during the next P3 workshop

☞ Panel 3 recognizes the necessity to make an effort to explain the context of the cross support management : a green book will be produced

☞ The work is on the point to be finalized : it would be a waste of effort to stop now

CENTRE NATIONAL D'ETUDES SPATIALES

Report to TSG/ MC - BOULDER - Fall 2000 - M. *Winterholer* 16/17

PANEL 3 — Conclusions

☞ Next Workshop will confirm the progress in the red books production

☞ Good hope to satisfy IOAG recommendations for SLE services by editing RAF, RCF, CLTU, FSP and FTCF as blue books in the first quarter of 2001

CENTRE NATIONAL D'ETUDES SPATIALES

Report to TSG/ MC - BOULDER - Fall 2000 - M. *Winterholer* 17/17

P3 Orlando meeting report – Workshop 25

Orlando meeting report obtained from the CNES participants notes written during the meeting.

All the presentations made during this workshop are available at the following url : ftp://bongo.jpl.nasa.gov/pub/ccsds/p3/Orlando_Briefings (the precise file names are indicated in the section titles)

21 persons attempted to the meeting. (from NASA, DLR, GST, VEGA, CNES, ISAS, NASDA, ESA) (See file # F on bongo)

Main issues

- **SM red book 2 should be available on May 2001**
- **CLTU should be available as a blue book on end of January 2001**
- **RCF & FSP should be available as blue on August 2001**
- **OMG / CCSDS liaison: road map, industrial announcements to do, Meeting OMG 23 April (Paris)**
- **Next WG1 meeting : end of March 2001 (27-30/03)**
- **Next P3 workshop (7,8-13 June 2001) – (in UK)**

Introduction (Maurice Winterholer) (see file # 1 on bongo)

- Organisation of the week (Space OMG day, KSC tour…), agenda presentation and update.
- Foreseen SLE books delivery planning (colour, issue and date)
- Main P3 action items presentation
- Work progress since previous workshop (CNES - Toulouse - June 2000)
- TSG/MC report : mainly IOAG request on prioritisation of P3 Transfer Services regarding Service Management activities

IOAG (Inter Operation Advisory Group)
IACG (Inter Agencies Consultative Group) : CCSDS specifications end users are more interested by Transfer Services than by the Service Management : they wish the Transfer Services to come on front end of the P3 activities to the detriment Service Management. As P3 chairman; M. Winterholer rejects this request mainly because the work on this subject is on the point to be finalized and, thus, it would be a waste of effort to stop it now.

Discussion on SLE SM complexity from a User point of view

It is highlighted and accepted by P3 members that efforts have to be done to make the Service Management more understandable. Actions have been assigned to improve this point.

WG1 Status briefing (Norm) (see file # 2 on bongo)

- Major modifications and works presentation

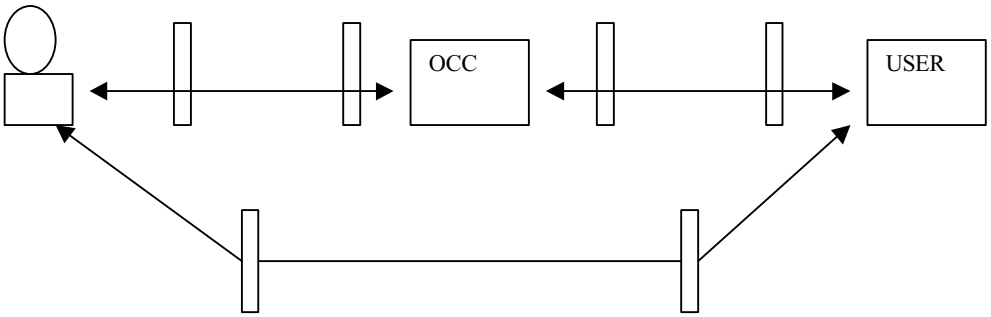
- Conformance to CCSDS style
- Remove Service Package report notification (duplication with GET operation).

MO re organisation definitions (John) (see file # 7 on bongo))

- Closer to SLE reference model.
- Easy to find information for implementers.
- Smaller clusters (function)
- Definitions are in the main body of the book

Proposal for Data Security activity within CCSDS P3 (Mario Meri – ESA/ESRIN) (see file # 8 on bongo)

- Objectives :
  - Identify guidelines for implementation of a data security strategy for ground segment communication
  - Make best use of available/future secure mechanisms
  - Produce a new P3 green book to document the above or to re-issue 350.0 G1
- Approach :
  - Several users / several profiles
  - Needs
  - Cost/benefits
  - Drive the security architecture and implementation
- Working model



- Security boundaries
  - Covers the ground side of data security
  - Capability of end-to-end data security system may not be desirable (? ?)
    - Decouples board and ground requirements
    - Allows ground to use latest data security mechanisms.
- Security objectives
  - Integrity, confidentiality, authentication, access control, availability, …
- Galileo project interest in this work
  - Perhaps Funding from Galileo to start activity
    - A CCSDS generic ground data security policy
    - A Galileo specific ground data security policy
- Initial thoughts on Data security
  - Hard to find overview information
  - Hot topic is « IP sec ».
  - « IP sec » : A promising data security mechanism for CCSDS P3.

SLE API Recommandations (Wolfgang Hell) (see file # 9 on bongo)

- Study contract with Anite
- Prime study output (WB for Proxy and ISP1 (tcp/ip and ASN1, ….))
- Different users (Space domain experts, API user, API implementers) : specific guides ?
- SLE SM ambiguities (Service Instance Identifiers)
- Memory management specificity on NT platform.
- Peer-abort using TCP urgent data (problem on NT)

SLE Service Management mapping rule (François Jocteur Monrozier) (see file # A on bongo)

- Formal language needed to describe SM interfaces to guaranty interoperability
- IDL-OMG is a good candidate (even if all the mapping on protocols are not yet available)
- SOAP (with XML messages) should be used for FTP / HTTP ; SOAP is too young and not mature enough

Space Day Information Agenda (Peter Shames)

- A Reference architecture has been defined.
- OM Space DTF **especially interests in P3 work** : Transfer Services and Service Management
- Presentation of OMG Specification Processes
- P3 is asked to participate and to look how its work could be integrated/associated in OMG framework
- **P3 point of view : no resource is defined to work on this topics**

SPLINTER SESSION

VEGA Service Management demonstration

- Presentation of the various software components
- Data accessed through a www server (service agreement creation)
- RMI applet is used to access to the Complex Manager entity

OMG SPACE DAY (see file # B on bongo)

Discussion after OMG day

- Intention and aim of OMG are not well understood (XML, CORBA ?)
- How P3 activities can be injected in OMG Space Domain Task Force (SDTF) activities

KSC TOUR

SPLINTER SESSION

Plenary (Friday)

WG1 Report) (see file # D on bongo)

- Next release of SM will include (May 2001):
  - SLE brochure
  - SLE Executive summary
  - Concept green book
  - SLE SM red book –2
  - SLE SM RF Characteristics Red book
- Next release of SM will not include :
  - SLE SM Authentication
  - SLE SM Implementation Mapping rules
  - Formal SLE SM MO descriptions
- Additional RIDs :
  - Eliminate peer-abort
  - Add ready-to-be-done
  - Eliminate cancel state (same as abort)
- P3 Workshop : April 30-May 4 (US, UK or Germany ?)
- Intermediate WG1 meeting 27-30/03.

WG2/3 Report) (see file # E on bongo)

- CLTU result : Blue draft scheduled for 15 January to be submitted as blue on end of January to the secretary. (for formatting but not distributed before Management council agreement)
- API
  - Three books scheduled for April 2001 : WB Proxy, WB Service element, Draft Green API
  - Pink sheet (companion page for any modification on book) for new services.
- Security
  - Analysis started
  - Statement of work preparation for industrial support
  - Draft outline expected in middle of 2001.
- Tracking data : Nothing new because of manpower limitation
- Planning
  - CLTU - B: sent to secretariat end of January 2001
  - RAF - B: sent to secretariat end of April 2001
  - RCF & FSP – R2 : sent to secretariat end January 2001
  - RCF & FSP – B1 : sent to secretariat beginning of August 2001

Conclusion (Maurice) (see file # C on bongo)

- **Next meetings**
  - **Spring 2001 in UK - June 7-8 for MC**
  - Other meetings in Spring 2001 on west coast
    - (Panel 1, 2) : 7-12 May,
    - **TSG (21-22 May)**
    - Plenary : mid of week 14-18

-
- Fall 2001 TBD in Europe for P1/2 TSG ? MC
- 2002 : Plenary anniversary
  - JSC Houston / SpaceOps
  - Garmisch / Euro ITC

- **P3 workshop # 26 in spring 2001 ? (before MC ?)**
- **Falls 2000 MC Meetings resolutions : i**n response to IOAG recom. : main dates to go to blue books
- **Documentation production schedule**
- **OMG / CCSDS**
  - Road map & work area definition for OMG SDTF
  - SLE SM presentation
  - Transmit official announcement of OMG meetings to P3
  - Officialize liaison with P2 activities
- **Actions**
  - P3 work plan work packages to be updated (**Maurice**)
  - work items description (end of january 2001)
  - Mario / Stoloff / Brosi : ask P1A &P1J what do they need in tracking requirements for telemetry catalogue, time correlation, and radiometric services)
  - Co-ordination with P1F et CFDP (Brosi)

- SM Promotion (SM brochure : "This is what you get when you implement SLE and SM " / Demonstrations / Web based promotion)
- Documentation status
- New work agenda for WG1

WG2-3 Status briefing (Martin Pillgram - DLR) (see file # 3 on bongo)

- CLTU review : Red 2 in June 2000. Proposition to go to blue during Workshop 25.
- WG 2-3 actions
- Items from IAOG meeting in October 2000 :

WG2/3 and WG 5 Status briefing (Mike Stoloff - NASA) (see file # 5 on bongo)

WG2/3 concerns

- RAF changes since June 2000
  - No substantive changes
  - Editorial corrections and « clean-up »
- RAF to blue book
  - WG meeting on March/April 2001 ? (in Europe ?)
  - P3 review of RIDs resolutions before next management council meeting

WG 5 concern

- 3 active Work Items
  - SLE API (draft a white book may 2001)
  - Implementation of SLE API with TCP/IP and ASN1 (draft a white book may 2001)
  - Security (no well defined objectives at this time).
- INTEGRAL SLE API Implementations
  - interoperability success between JPL and ESOC for SLE API implementation
  - Specific NT services problems raised by Wolfgang (ESOC).
  - Should be operational on October 2001

SLE Service Management : Red book review (Nancy) (see file # 6 on bongo)

- 301 RIDs received.
  - Major are non technical
  - Most changes are technical but minor
  - Some changes have implications on P3 work
  - Open RIDs (13) : discussion needed with WG 2/3
  - 17 RIDs rejected.
  - 131 accepted and integrated in the future release of the document.
- SM reorganisation
  - MO organised by Functional Group
  - Operations thoroughly updated
  - State diagrams.
- Still to do
  - State material
  - Containment relationships

Attachment R

Reference Model Briefing

by INPE/Eduardo Bergamini

INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS - INPE
MINISTÉRIO DA CIÊNCIA E TECNOLOGIA - MCT
SÃO JOSÉ DOS CAMPOS, SP, BRASIL

PROPOSAL OF A NEW CCSDS PARADIGM FOR INTERAGENCY INTEROPERABILITY

presented by

Eduardo W. Bergamini

to the

CCSDS MANAGEMENT COUNCIL MEETING

30 NOVEMBER , 2000

LASP/Univ. of Colorado, Boulder, CO, USA

INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS - INPE
MINISTÉRIO DA CIÊNCIA E TECNOLOGIA - MCT
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PREMISE AND MOTIVATION FOR THIS PROPOSAL

Given the high degree of diversity and complexity represented by the set of CCSDS standardized Recommendations, added by its natural and constant increasing in relationship with other external, formal or 'de-facto' standards which are being adopted, generated or commercialized by other organizations (IOAG, IACG, OMG, contractors, vendors, users, etc.) which, in their turn, are also increasingly getting involved, concerned or interested on CCSDS products, a situation which is gradually fostering and unfolding a whole new set of **'Interagency Permanent Forums'** which is also engaging CCSDS, it is being proposed by INPE to the CCSDS Management Council (MC) forum **a new paradigm**, represented under the form of a diagram (to be constantly reviewed and updated), which tries to characterize an expanding and desired synergy and relationship of the CCSDS structure of expertise and products with these other organizations, while also proposing the methodical adoption of two concepts, as part of such a paradigm, and which are defined under the names of: **CCSDS Layered Model (CLM)** and **CCSDS Application Profile (CAP)**, in addition to the already existing concept of **CCSDS Reference Model (CRM).**

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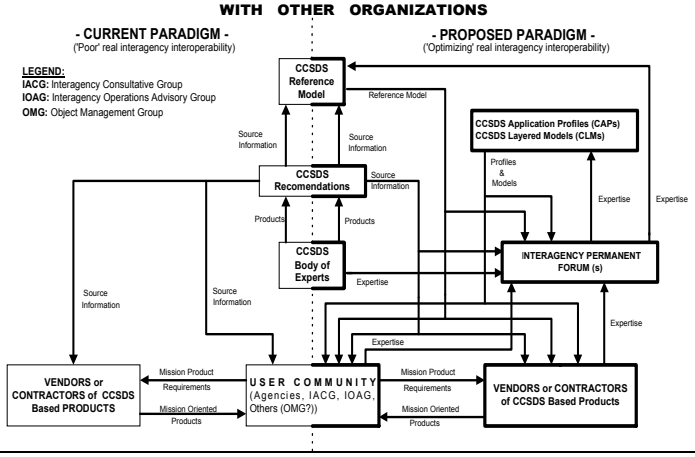
PROPOSED DIAGRAM OF A CCSDS PARADIGM FOR PROMOTING OR DEVELOPING INTEROPERABILITY WITH OTHER ORGANIZATIONS



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BASIC MODELS & PROFILES FOR THE PARADIGM

MAIN OBJECTIVE: Provide a source for accessing permanent, updated reference, containing basic ('quick-look') information related to CCSDS Recommendations that highlights and promotes the potential of the standardized Recommendations in support to decision and implementation processes which are expected to comply with Interoperability and Cross- Support requirements in real applications, while also promoting a -common- understanding among: Interagency, User, Vendor, Contractor and other concerned, application related communities.

The Basic MODELS & PROFILES being considered, are:

1. CCSDS REFERENCE MODEL (CRM):

An already existing CCSDS concept, in the form of a basic **scheme**. Both concepts: CCSDS Layered Model (CLM) and CCSDS Application Profile (CAP), which are being proposed in this context would be expected to have each of them, their pertinent schemes and profiles specified in a compatible fashion with the CCSDS Reference Model (CRM).

2. CCSDS LAYERED MODEL (CLM):

A -proposal- for the adoption and maintenance of a basic collection of applicable **schemes** containing CCSDS layered protocols and also, whenever considered pertinent, including also other external protocols, and possibly also interfaces considered pertinent, at application levels. It would also be expected that such a collection of schemes would easily promote a quick comprehension for visualization of a potential application of the pertinent protocol stacks and interfaces that can be required in real scenarios, representative of space mission oriented, intermediate segments or end-to-end architectures of space data systems; A CCSDS document (Yellow Book?) could be created and maintained for containing all CCSDS Layered Models (CLMs) which may be considered of importance, for collection;

3. CCSDS APPLICATIONS PROFILE (CAP)

A -proposal- for the adoption and maintenance of a collection of **forms**, each of them containing a profile to be strictly derived from a -unique-, pertinent CCSDS Recommendation (Blue Book) and, in this way, each of them, specifying a -complete- set of features, divided in prioritized categories under specific classes, like: Mandatory, Highly Recommended, Optional, Other(s) t.b.d. The contents of this form are expected to promote, in advance, a (potentially) higher degree of effective interoperability and cross support in actual implementations of each CCSDS Recommendation, for a client organization (Agency, etc.). It could also be expected that each CCSDS Blue Book where a CCSDS Application Profile (CAP) may be (uniquely) derived from, may have it incorporated to its contents, possibly as an Appendix, whenever the Blue Book may undergo a periodical revision, as part of the already existing review process being practiced for each Recommendation, by CCSDS. Alternatively, a CCSDS document (Yellow Book?) could be created and maintained for containing all existing CCSDS Application Profiles (CAPs), that can be collected.

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CCSDS APPLICATION PROFILE (CAP) FORM: A Proposal

CCSDS APPLICATION PROFILE: <version>			
CCSDS RECOMMENDATION: <doc. version-unique>			
LEVEL-OF-REQUIREMENT	FEATURES		
	NAME	PARAMETER(s)	UNIT(s)
(OPERATIONALY) MANDATORY			
(AVAILABILITY) HIGHLY RECOMMENDED			
(AVAILABILITY) OPTIONAL			
(OTHER(s))			

CCSDS MC Meeting, Boulder, CO, USA, 30 Nov., 2000 p.5/5, 20.11.00, E.W.Bergamini/SlidesCCSDSMC.ppt

Attachment S

CCSDS Web Site Issues Briefing

by NASA/Peter Shames

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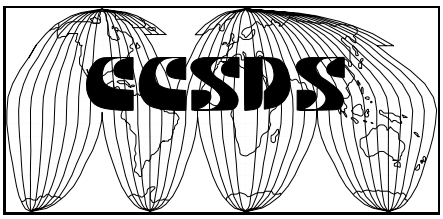
CCSDS Web Site Concept



Peter Shames
JPL Information Systems Standards Manager

12 January 2001

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CCSDS Web Site Overview

- **Current CCSDS Web Site supports several functions**
  - **Overview of organization, structure, processes**
  - **On-line access to formal documents**
  - **Meeting notices, calendar, sign-ups, and agendas**
  - **Some amount of working information**
- **We want to add new features**
  - **Improve overall look and feel to level of other professional organizations**
  - **Improve freshness of site**
  - **Easy to locate current topics, formal documents, and related information**
  - **Free form text search of documents**
  - **Improve support for organizational processes**
  - **Incorporate information on implementations and missions**
  - **Include links to related organizations & compliant vendors**

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Enhancements

- **Enhancements to existing capabilities**
  - **Make site more user friendly, easier to navigate for newcomers**
  - **Make new/updated items more visible**
  - **Include more current information on projects, work content, status**
  - **Update appearance, add more graphic content**
    - **Continue to support users on low speed connections**
  - **Improve search capabilities**
    - **Search any/all text documents, in whatever form**
    - **Return documents in variety of forms (native, PDF, raw text)**
  - **Include links to related CCSDS org web sites**

- **Potential new capabilities**
  - **Tutorial on CCSDS documents and web site content**
  - **Tutorial on CCSDS protocols and standards**
  - **Include information on affiliates, associates, and liaisons (links where appropriate)**
  - **Include information on CCSDS compatible implementations, products and services (and links to all commercial sites)**
  - **Include reference implementations, either contact points or library**
  - **Create Panel public and private pages**
    - **Permit Panel and subpanel chairs to update their sections on their own**

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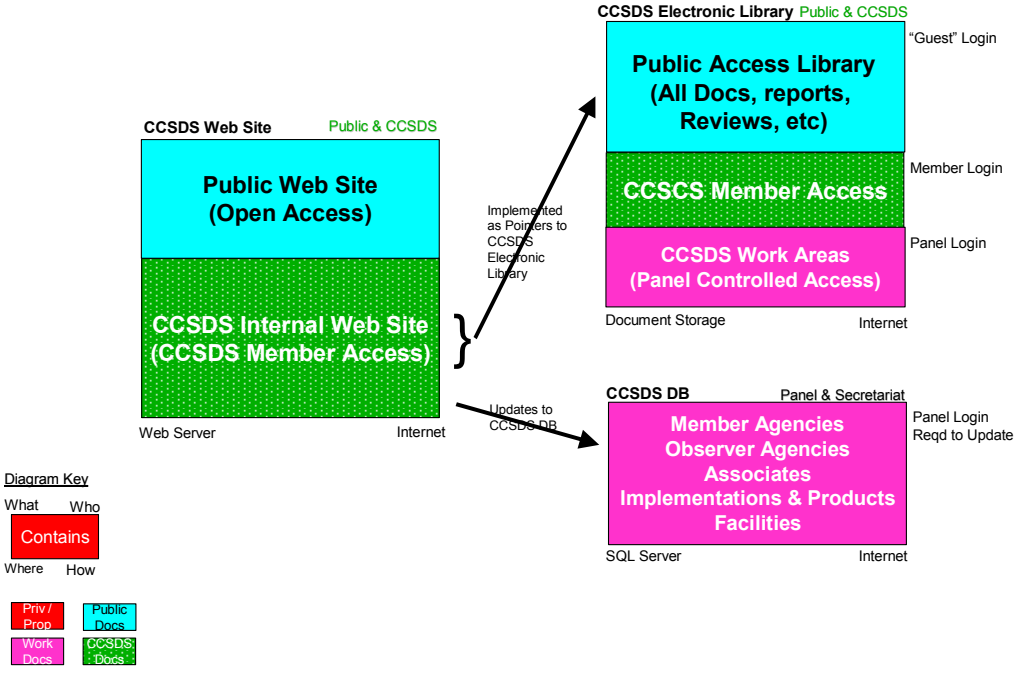
Conceptual Site Structure



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CCSDS Web Site Components

- **Web Site**
  - Web site provides visible front door to the CCSDS organization and products
  - Uses server technology suitable to support expected load
  - Is designed to support broad user community from PC, Mac, and Unix platforms, using Netscape or Internet Explorer
- **Electronic Library**
  - Provides fundamental mechanisms for managing all documents, in all forms
  - Provides full text search of all stored documents
  - Uses existing document management technology like Xerox Docushare
  - Provides all of the required access & control functions thru an easily integrated web interface
  - May support direct use of XML for document storage and retrieval
- **Database**
  - Provides means of storing and accessing tabular information
  - Provides both canned and custom query and report functions
  - Uses existing DBMS technology like Oracle or Sybase
  - Provides all of the required access & control functions thru an easily integrated web interface
  - May support direct use of XML for data entry and extraction

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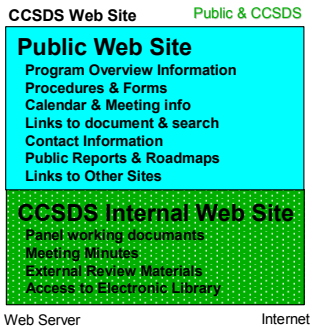
CCSDS Document Management Approach Web Site



Implemented as Pointers to Document Storage

CCSDS Web Site
(Internet & Intranet Access
No Login Required)

- If information is to be disseminated to the general public it MUST be placed directly in the CCSDS Web site.
- This includes all items shown in the Light Blue Box to the left
- New materials may be added to existing pages, or …
- New pages may be added to the publicly visible areas
  - With new introductory (descriptive) content
  - or pointers to lists of documents
  - or pointers to other public sites
  - but the documents themselves may only be in the Web Site itself if they are to be accessible to public users
- Backup copies of any materials stored in the public Web Site should be placed in Document storage

- All items shown in the Speckled Green Box are part of the CCSDS Intranet
- These items are only visible to users in the specific sites we add to the access control list
  - These would include: member agencies, their contractors, other partners)
  - This access control will be done at the site, subnet, or CPU (IP addr level) as required
- New materials may be added to existing Intranet pages, as noted above
- Content may be in the Web Site itself, or actually stored in the document storage, as is the case with the books, Review Materials, Etc
- Typically there is descriptive material in the Web Site which then points to the actual documents in document storage

Diagram Key

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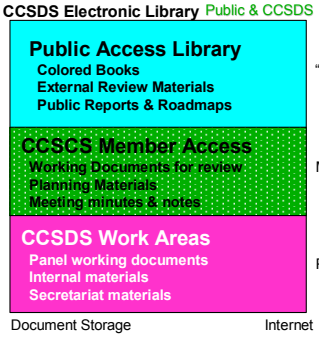
CCSDS Document Management Approach
Electronic Library



CCSDS Electronic Library
(Member Intranet Access
Login Required for some areas)

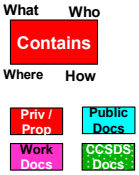
- NOTE: If information is to be disseminated to the general public it MUST be placed directly in the CCSDS Web site, NOT in the E-lib.
- Default access to the E-lib requires no login (implied GUEST status), these are shown in light Blue Box
- New content may be added to these Public visible areas (and others)
  - By anyone in the Secretariat (login required to update)
  - may be documents of various flavors
  - may be pointers to other public sites (URLs)
  - documents in the electronic library are full text searchable
- Backup copies of any materials stored in the public Web Site should be placed in the document storage

- All items shown in Speckled Green Box are part of the CCSDS Member private area
- These items are only visible to the CCSDS member organizations
  - Panel chairs and others, as needed, have read / write access to this area
  - Use this area for working documents (pre-release) and for other working and planning materials

- All items shown in Magenta are part of the CCSDS Panel work area set
  - Only Panel members have access to each area,
  - Use this area for Panel internal information, working documents, background materials
  - Secretariat will also have a private area under its control

- Site Admins will have to create new accounts and manage the entire folder structure. The Admins can access and update any documents.

Diagram Key



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Details on Augmentations

- **Management of overall web site content**
  - Identify web site experts to manage the site
  - Create a web coordination team drawn from CCSDS member agencies to provide informal review and feedback
  - MC only requires review of top level web page & concept, not content
- **Integrated web site should include:**
  - Layered approach , full modern graphics, professional appearance
  - Use of current tools and technologies (as in diagram)
  - Support for public, panel status, private (controlled access) work areas
  - Support for full document search across web site and document base
- **Use of enhanced CCSDS web site**
  - Panels want to have ***some*** of their working information public
  - Require panel working pages that they can updated and manage themselves
  - Require private working areas for panel documents in progress

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Details on Augmentations, contd

- **Additions to web site**
  - **Listings of implementations and missions**
  - **Links to related web sites for products and services**
  - **Links to web sites of any suppliers who provide them**
  - **Updated news and reports**
  - **Links to related web sites in other organizations (ISO, OMG, ...)**
  - **Include tutorials, demos, and success stories, links to such sites**
  - **Improve on-line RID submission & handling, along with the ability for an agency to manage its RIDs internally before submitting them for wider review**
  - **Updated agendas, logistics, registration, calendar, FAQ, possibly updated directly by panel chairs**
  - **On-line sign-up for observing members, affiliates, liaison organizations (vetteing by Secretariat before inclusion)**
  - **Add function to do action item tracking and management for MC & panels**
  - **Add support for management of electronic lists (Email exploders, Majordomo?)**
  - **Visible counter showing # of hits on the site, # of downloads**

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Details on Augmentations, contd

- **Access Issues**
  - **Use IP address filtering for general access control to "member" areas**
  - **Use secure login for authenticated access from registered sites**
  - **Provide "VPN" like access mechanism so that registered members can access and update from anywhere**
- **"FTP" support for access to support materials, with optional security and access control, including:**
  - **Software**
  - **Documents**
  - **Presentation materials**
  - **Meeting minutes**
- **Support the "link challenged" using dial-ups**
  - **Graphics / text switch**
  - **Ability to select document download options (Word vs PDF)**
  - **Options re data compression for download**
- **Other Site Considerations**
  - **Web site <u>not</u> on a NASA center because of Web content control issues**
  - **Site to support common use by all agencies and panels, with privacy issues handled appropriately using access controls**

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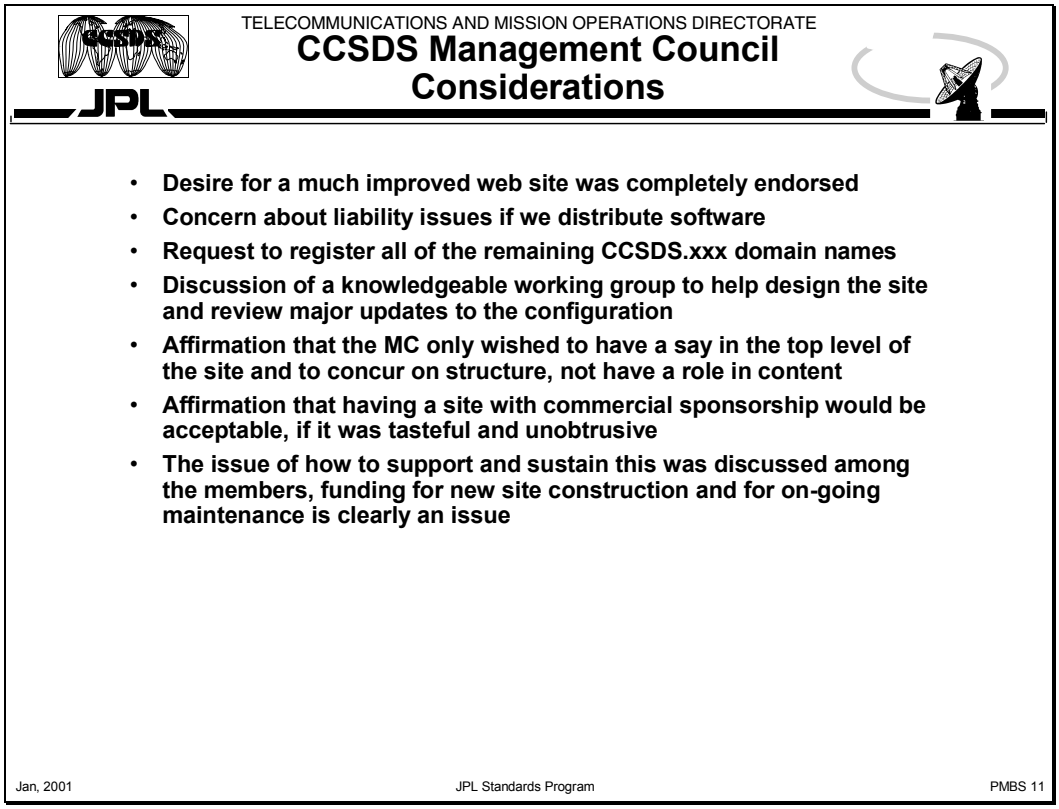
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CCSDS Management Council
Considerations
• Desire for a much improved web site was completely endorsed
• Concern about liability issues if we distribute software
• Request to register all of the remaining CCSDS.xxx domain names
• Discussion of a knowledgeable working group to help design the site and review major updates to the configuration
• Affirmation that the MC only wished to have a say in the top level of the site and to concur on structure, not have a role in content
• Affirmation that having a site with commercial sponsorship would be acceptable, if it was tasteful and unobtrusive
• The issue of how to support and sustain this was discussed among the members, funding for new site construction and for on-going maintenance is clearly an issue
Jan, 2001
JPL Standards Program
PMBS 11